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Rock Products

$2.00 A YEAR | CHICAGO | FEBRUARY 26, 1919

The Source of Good Roads

—crushed stone—from your quarry. You have a national responsibility: That of supplying your share of the tremendous quantities of crushed stone the country will ask for during the coming years to make roads passable.

Why the Traylor "BULLDOG" Gyratory Crusher?

Because it has exclusive features which put it in a class by itself either as a primary or secondary crusher. For "Bulldog" Gyratory Crushers have a shaft that is much shorter and 100% stronger than standard gyratory shafts—an eccentric that is both longer and of greater diameter than others—and a positive force-feed lubricating system — all features that make for increased production with decreased power consumption.

Write the nearest Traylor man for full information about the "Bulldogs."

TRAYLOR CRUSHERS

will enable you to produce your portion of crushed stone—at a good profit. We do not mean "profit" in the sense of profiteering, but extra profit gained through economical production methods.

Traylor Crushers are made in various models for every kind and stage of crushing—from jaw to gyratory. Our literature illustrates and explains.

Traylor Engineering & Mfg. Co.

ALLENTOWN, PA.

New York, 30 Church St. | Los Angeles, Citizens Bank Bldg. | Chicago, Fisher Bldg. | Spokane, Mohawk Block

for 5 years the elements tried to destroy it—but today it is as good as new

A Keystone Kiln has stood—with top uncovered—since 1914 at a deserted quarry of the Montgomery Lime Company in Houchins, Va.

Today it is being moved sixty miles to a new location by the Kimbalton Lime Co. It is as good as new!

So satisfactory was its performance during the nine years of actual use that the Kimbalton Lime Co. has ordered a sister kiln to meet increased-production plans.

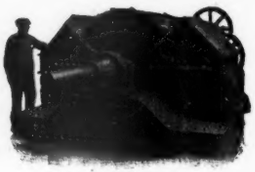
Keystone Kilns

Here you have proof of singular durability and working merit. And note that the Keystone can be moved. This can be done with no other kiln.

234 Kilns in Use to Date

Steacy-Schmidt Manufacturing Co.
York, Penna.

"PENNSYLVANIA"
Hammer Crushers



PATENTED

For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

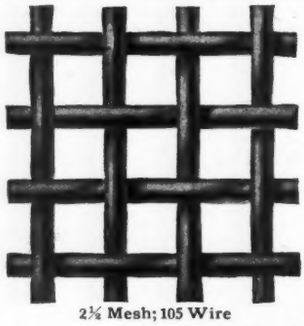
Pennsylvania Crusher Company
New York PHILADELPHIA Pittsburgh

We Design and Equip Complete Plants

for the manufacture of gypsum products, such as wall plaster, moulding plaster, wall board products, gypsum block products, also mixing plants.

We are prepared to furnish complete machinery-equipment and design and furnish plans for the installation. Consult our Engineering Department. Forty years' experience in designing of wall plaster machinery and plants.

The J. B. Ehrsam & Sons Mfg. Co.
Engineers, Machinists and Founders
Enterprise, Kansas



2¾ Mesh; 105 Wire

"Cleveland" Double Crimped Wire Cloth

Especially Adapted for
Sand, Gravel, Crushed Stone, Lime

We manufacture only one grade of wire cloth and screens—the best. All "Cleveland" Screens are strictly double crimped. Every mesh counts square, and wire gauges true to size.

Double crimping is an invaluable feature. It means that both the warp and shoot wires are crimped equally, thereby securely locking the wires at their intersections. In this way a uniform size of mesh is maintained until the screen is worn out. It also enables both wires to present an even wearing surface, which means long life for the screen.

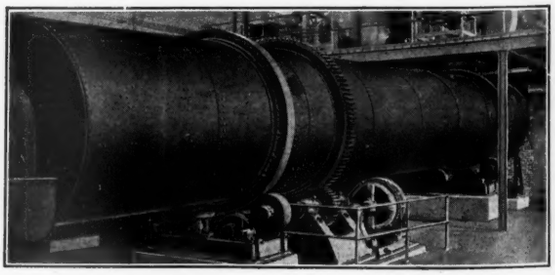
Catalog Upon Request

The Cleveland Wire Cloth & Mfg. Co.
3571 East 78th Street, Cleveland, Ohio

We are especially equipped to make cloth for the requirements of mills in the making of agricultural lime

Ruggles-Coles Dryers

for coal, clays, sand, stone, etc. They will burn less fuel than any other type and with their low power and repair costs are most economical to operate.



Built to Dry at the Lowest Ultimate Cost

Ruggles-Coles Engineering Co.

McCormick Building, Chicago — **50 Church Street, New York**

WORKS: YORK, PENNSYLVANIA

Special—Trial Subscription Offer!!

CUT OUT AND MAIL

ROCK PRODUCTS,
542 So. Dearborn St.,
Chicago:

Here's ONE DOLLAR for a special six months' trial subscription.

Name .....

Address .....

This Is the One Useful Journal Dealing With

Lime, Cement, Crushed Stone, Limestone, Sand and Gravel

and all products of the

Quarry, Pit and Bank

This journal covers every phase of these industries—

Production, the Selling end, and the Business side.

Technical matter on engineering, operation, machinery, etc., is highly practical, written in plain English, with a multitude of pictures.

MARKET PRICES

in every issue, arranged according to locality. No more guesswork as to values.

Whatever is noteworthy in the industry finds a place in ROCK PRODUCTS' pages, with special attention to engineering features and operating economies.

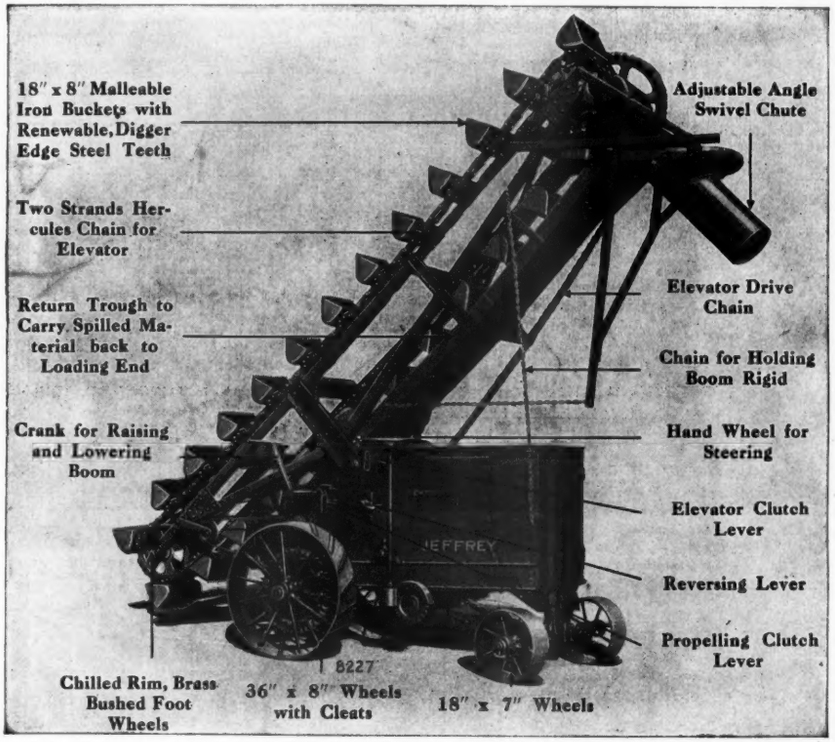
A very useful journal, a very necessary journal, to every ambitious man in the rock products industries.

Rock Products, 542 So. Dearborn St., Chicago

ROCK PRODUCTS is published every other Wednesday by Tradepress Publishing Corporation, 542 So. Dearborn St., Chicago. Subscription: $2.00 a year in the United States, $3.00 in Canada. Entered as second class matter July 2, 1907, at the post office in Chicago, under act of March 3, 1879.

Are You Equipped to Handle Your Materials Quickly and Economically?

With the construction field opening up with a rush you cannot afford to load materials by hand.


18" x 8" Malleable Iron Buckets with Renewable, Digger Edge Steel Teeth
Two Strands Hercules Chain for Elevator
Return Trough to Carry Spilled Material back to Loading End
Crank for Raising and Lowering Boom
Chilled Rim, Brass Bushed Foot Wheels
36" x 8" Wheels with Cleats
18" x 7" Wheels
Adjustable Angle Swivel Chute
Elevator Drive Chain
Chain for Holding Boom Rigid
Hand Wheel for Steering
Elevator Clutch Lever
Reversing Lever
Propelling Clutch Lever
JEFFREY
8227

Handle it Mechanically

WITH A

Jeffrey Self-Propelling Loader

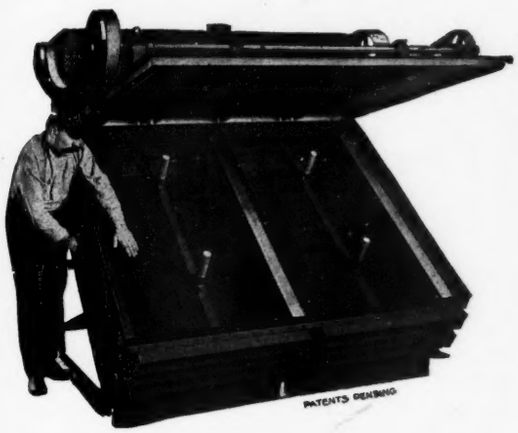
It does the work of 5 to 10 men in loading Sand and Gravel, Crushed Stone, Coal and similar materials, at less cost and with less trouble and supervision.

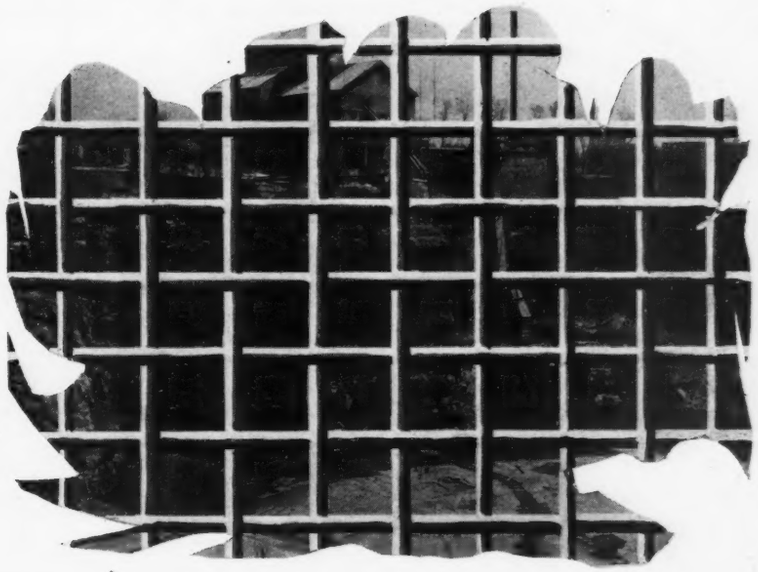
An inexpensive one-man machine—Self-Feeding and Self-Propelling—Practicaly fool-proof—Built for years of hard service.

Write for Loader Bulletin No. 177-D and see how the Jeffrey Loader is saving money for Contractors, Pit and Quarry Owners, Building Supply Dealers, etc.

The Jeffrey Mfg. Co., 935 N. Fourth St., Columbus, Ohio

TYLER SCREENS
Cover Every Need





Whip-Tap Separator

Screens Efficiently and Economically

Tonnage-capacity and clean separation depend upon a taut, smoothly stretched, and effectively vibrating screening surface.

The Whip-Tap Separator Screen, like the kettle drum, is so designed that the tension is at all times under the control of the operator. By merely turning a key, the tension is maintained at the correct degree to produce maximum screening efficiency.

The Whip-Tap Screening surface is always taut and smoothly stretched; every wire is constantly vibrating; and the material flows uniformly over the entire screening surface, allowing every opportunity for the fines to be separated from the coarse.

Write for Particulars

THE W. S. TYLER COMPANY

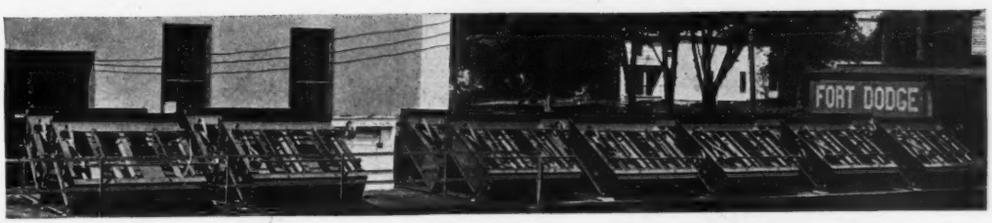
Manufacturers of Tyler "Double Crimped" Wire Cloth and Ton-Cap Screens.

CLEVELAND, OHIO

26 Whip-Taps

Here is a photograph showing part of a shipment of 26 Whip-Taps installed by a silica company. This concern tested Whip-Taps and found tonnage and uniformity decidedly increased.

Investigate what the Whip-Tap would do on your product



SYMONS DISC CRUSHER

"The Master Crusher"

"Good Roads!"—

—the slogan of every progressive State in the Union—will become a reality now that after-war conditions will permit the direction of labor towards road construction.

Think of the increasing demands that will be made for crushed rock and gravel!

Are you prepared to gain your share of the profits that will come with this new era of prosperity? Is your plant ready for capacity production?

Symons Disc Crushers will make your plant 100% efficient. It will pay you to investigate why it is the favorite of the most experienced producers. Write for descriptive catalog today!

CHALMERS & WILLIAMS
1425 Arnold Street Chicago Heights, Illinois

Record of a 48-in. Crusher in the Field

Material Crushed: Limestone

Length of time operated, 3 yrs.

Size of Feed, 4"

Size of Product, 1 1/2"

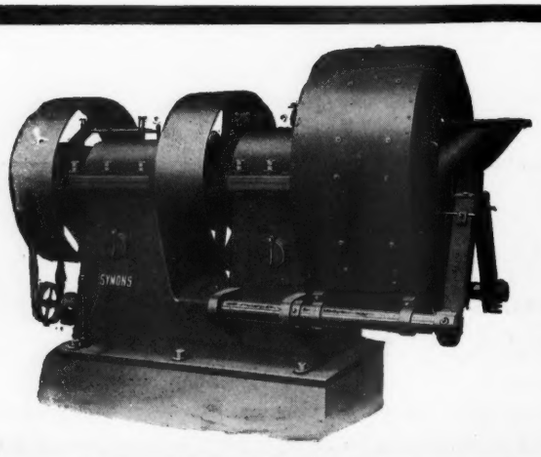
Horsepower used, 65

Tons per hour, 80 to 100

Tons crushed per set of discs, 750,000

No lost time on account of breakage

We also build them in 18" and 36" size.



Record of a 24-in. Crusher in the Field

Material Crushed: Gravel and Hard Heads

Length of time operated, 2 yrs.

Size of Feed, 2"

Size of Product, 1/2"

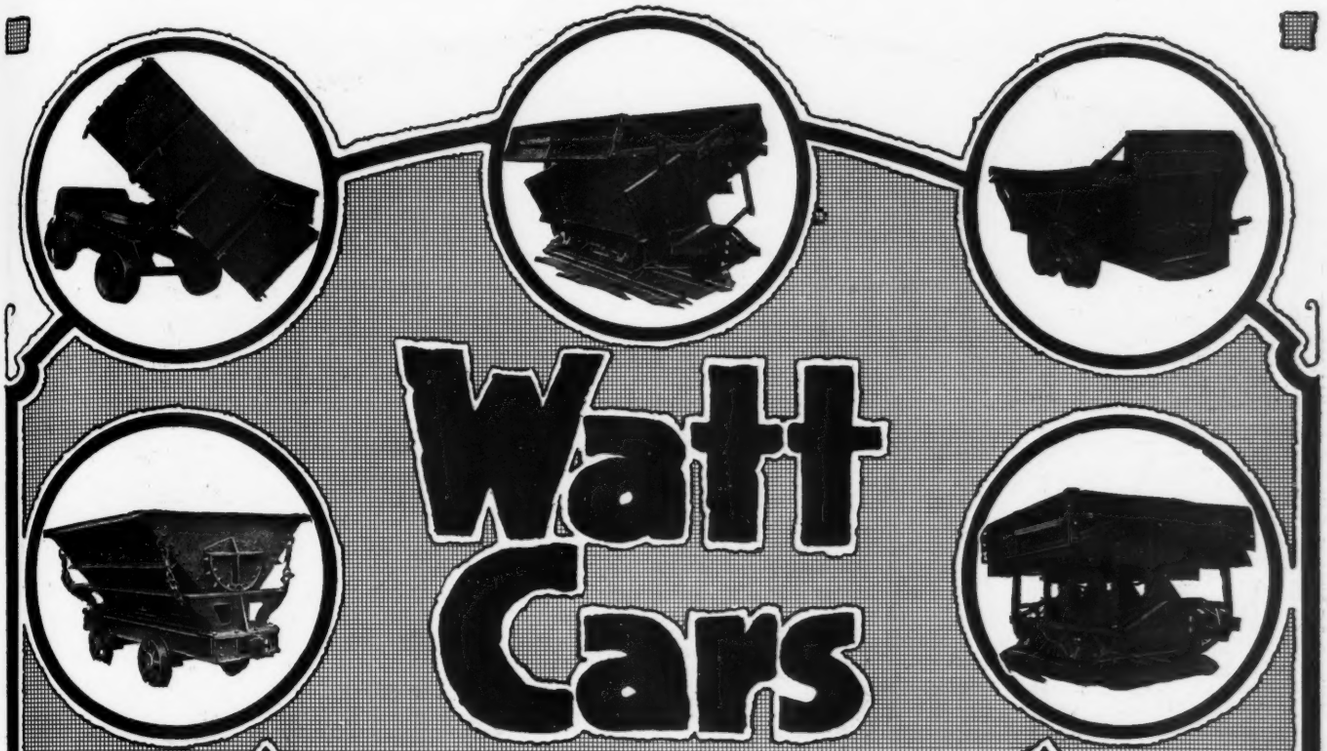
Horsepower used, 20

Tons crushed per hour, 25

Original crushing discs still in use

No lost time account breakage.

Superior to Kolls, Jaw or Gyratory Crushers on this class of work.



Watt Cars

For over a half century we have been designing and manufacturing mining and industrial cars until **today** the name WATT stands for "the best," and the cars bearing this name are manufactured in the largest plant of its kind in the world, and are shipped to all nations on the globe.

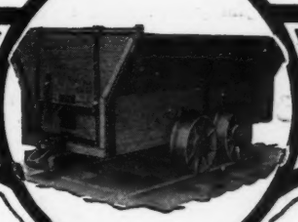
Our success is your assurance of better satisfaction. We guarantee durable, proven cars that are designed efficiently to secure the maximum results at your plant.

We have five catalogs describing Mining Cars, Industrial Cars, Ore Cars, Wheels, Couplings. Or you may have the five catalogs grouped together under one cover. Which do you wish?

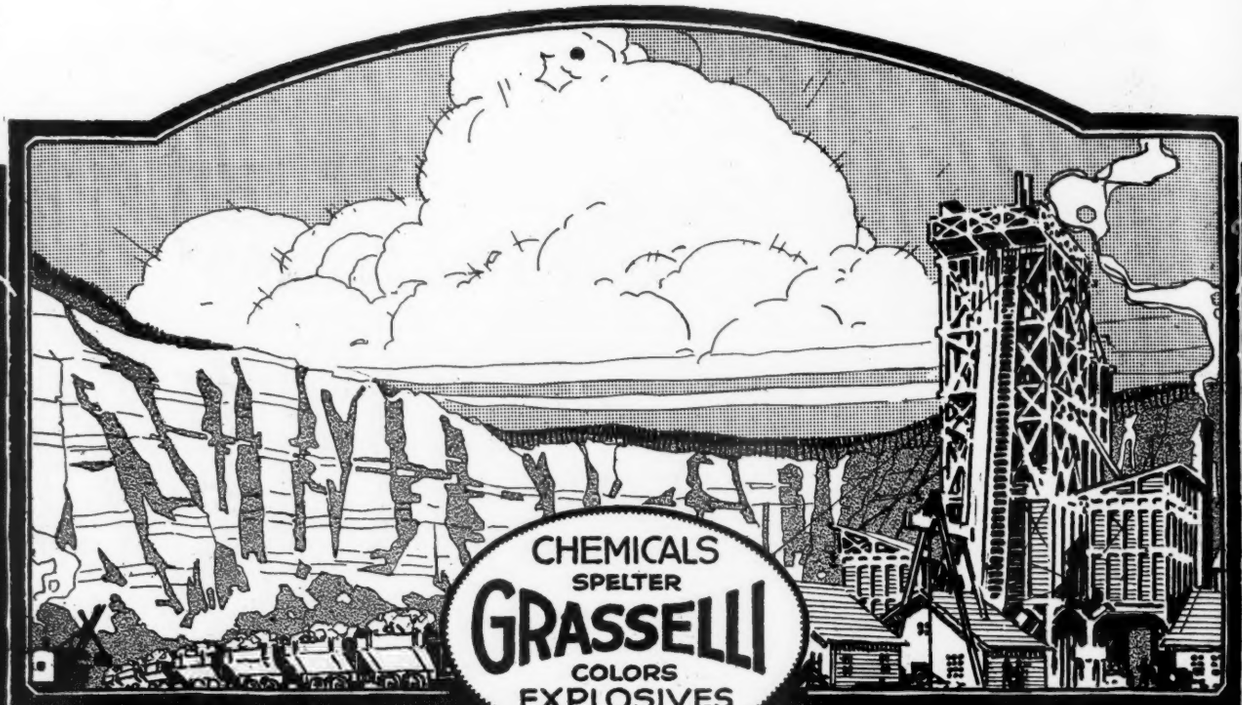
The Watt Mining Car Wheel Co.
Barnesville, Ohio

Denver:
Lindroth, Shubart & Co.
Boston Bldg.

San Francisco:
N. D. Phelps,
Sheldon Bldg.



Saying, "I saw it in ROCK PRODUCTS," will bring quick action.



GRASSELLI EXPLOSIVES

In the sudden readjustment from war-time to peace-time basis, the problem of stone production still remains one of urgent importance.

It is here that The Grasselli Powder Company can render practical assistance. With increased facilities and intensive specialization gained through the years of war work, the "Grasselli" organization turns its equipment and knowledge over to American stone industries, confident in its ability to give a greater service in the present and future as it has in the past.

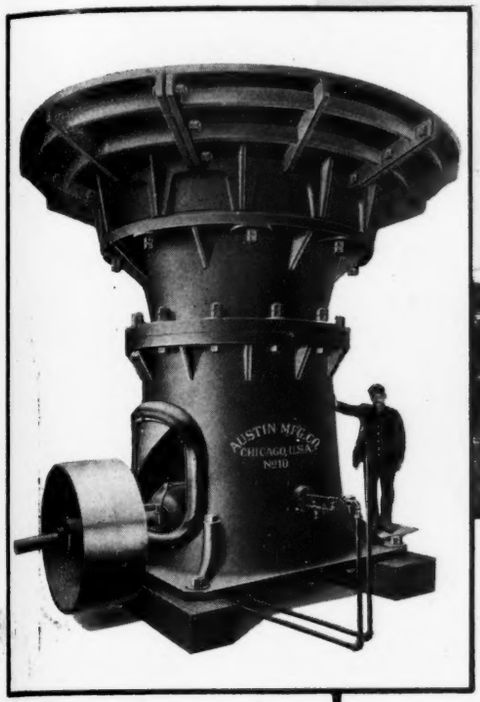
With its splendidly organized service department and its quality explosives, which have been standardized by years of meritorious work, The Grasselli Powder Company stands today in a better position than ever before to extend to stone operators its fullest co-operation in the solution of production problems.

Information regarding "Grasselli" service explosives gladly furnished upon request

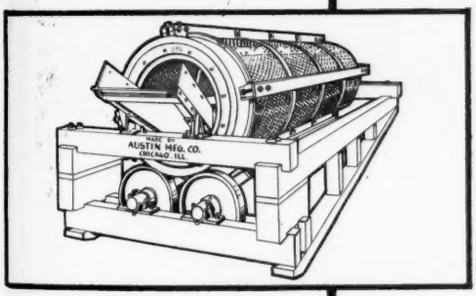
The Grasselli Powder Company

Cleveland, Ohio

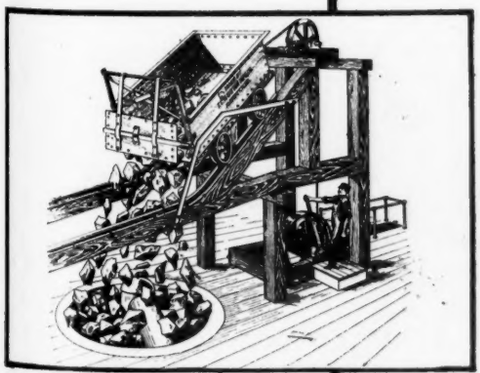
For better service say, "I saw it in ROCK PRODUCTS."



Austin Gyratory Crusher



Austin Standard Revolving Screen



Austin Automatic End Dump Car

During the War the United States and Allied Governments purchased
OVER 700 AUSTIN MOTOR ROLLERS
More than ten times their combined purchases of all other rollers. AND AT HIGHER PRICES. **WHY?**

Super Strength

Perhaps no other industrial machines require the ability to withstand such rough usage as Rock Crushers, Screens and Automatic Dump Cars.

All **Austin** Rock Equipment is built with a thorough knowledge of the requirements of such machinery gained by the broadest kind of experience covering a period of over 40 years.

Austin Crushers, Elevators and Screens are made in many sizes and capacities—both Stationary and Portable Types.

Our free catalogue will tell you all about **Austin** Super-Strength Rock Equipment. We also manufacture

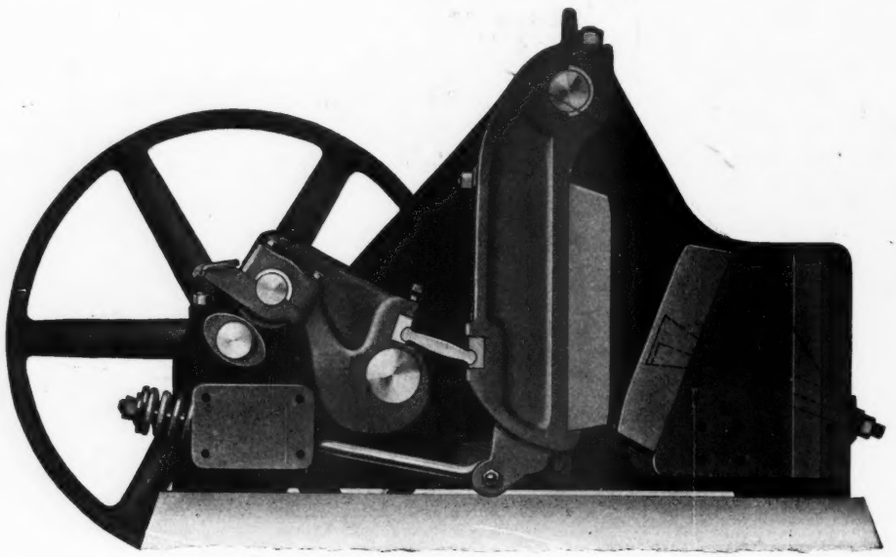
Rock Crushers	Stone Spreaders	Street Sweepers
Portable Stone Bins	Road Graders	Street Sprinklers
Stone Elevators	Elevating Graders	Street Oilers
Stone Screens	Blade Graders	Combined Sweeper-Sprinklers
Road Rollers	Dump Wagons	Motor Tandem Rollers
Horse Drawn Rollers	Road Scarifiers	Motor Macadam Rollers

Austin Manufacturing Co., Chicago
New York, San Francisco

"ONE MAN – ONE MINUTE"

STURTEVANT "OPEN-DOOR" MACHINERY

DOUBLE CAM AND ROLL JAW CRUSHERS

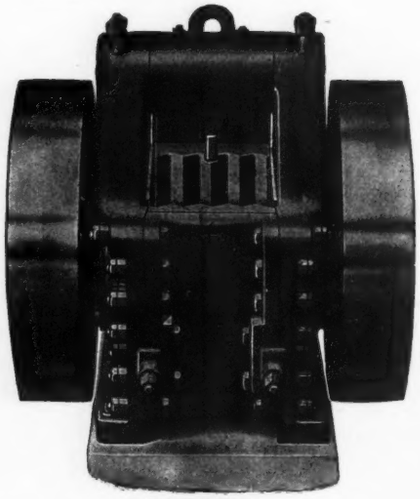


PATENTED

FOR COARSE, INTERMEDIATE, AND FINE CRUSHING

Two jaw nips to each revolution of flywheels. One-half the shaft speed of others to obtain equal outputs. Slow speed. No hot boxes. Small double cam actuating a large roll is the simplest, most powerful and slowest moving action known, hence durability.

Cast steel construction combined with great leverages makes a machine of unusual power, durability and strength.

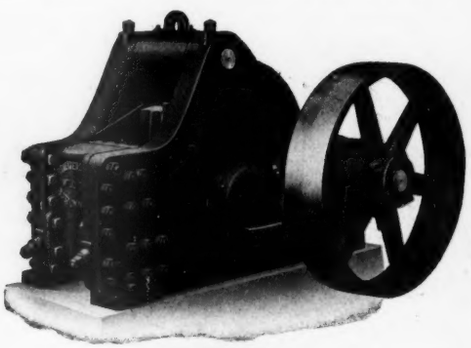


PATENTED

Many Sizes and Different Actions to Suit Various Conditions

ALSO

"OPEN-DOOR" ELEVATORS



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STURTEVANT MILL CO., BOSTON MASS.

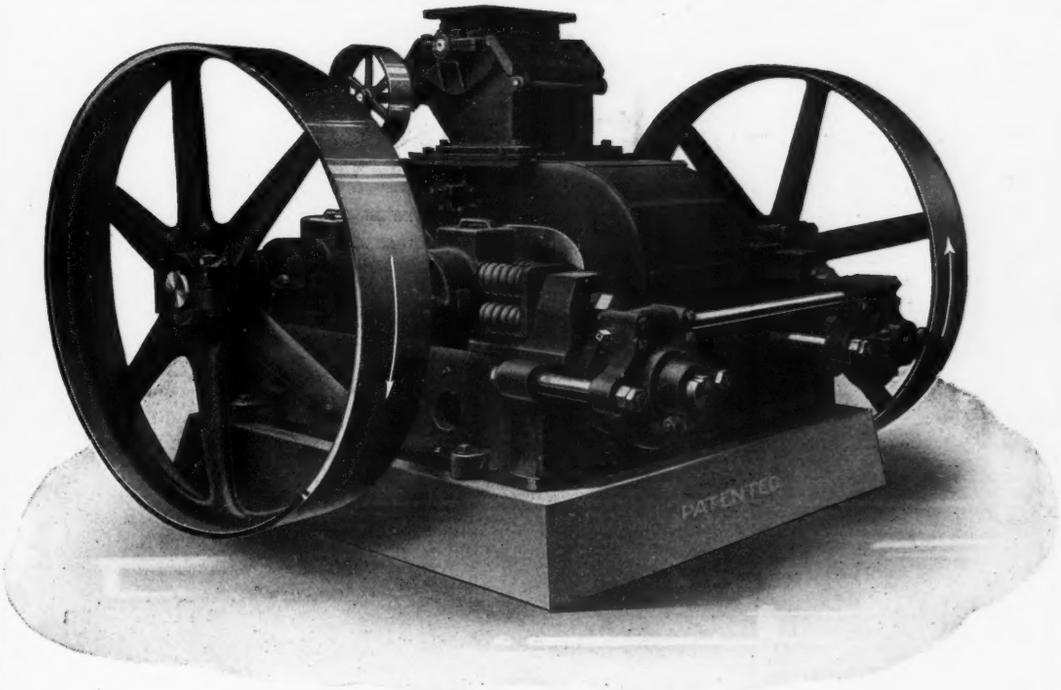
HARRISON SQUARE

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

"ONE MAN – ONE MINUTE"

STURTEVANT "OPEN-DOOR" MACHINERY

BALANCED CRUSHING ROLLS



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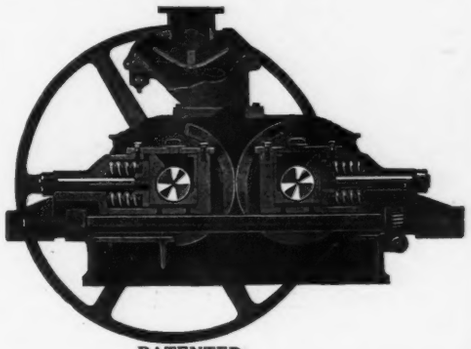
CRUSHING SHOCKS QUARTERED

Because the springs back of **all four** bearings allow the rolls to spring back in relief, **equally** and **oppositely,** thus balancing each other and **QUARTERING** the usual crushing shocks common to such machines.

Automatic adjustments, while operating—No shims—Great, strong, massive machines, built to withstand hardest usage, such as crushing of Ores, Emery, Alundum, Corundum, and other hard abrasives.

Sizes: 8x5, 12x12, 16x10, 20x14, 22x14, 26x15, 30x16, 32x16, 36x20, 38x20.

PATENTED



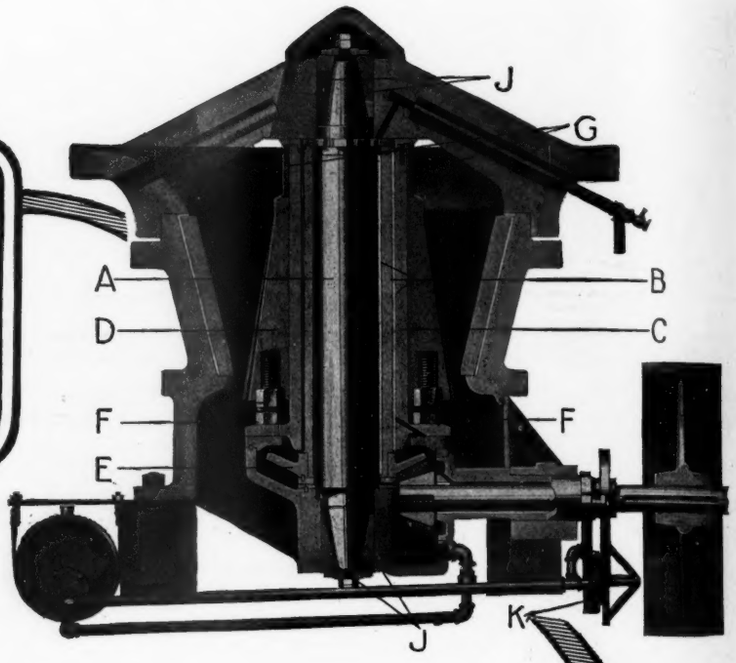
PATENTED

STURTEVANT MILL CO., BOSTON MASS.

HARRISON SQUARE

You will get entire satisfaction if you mention ROCK PRODUCTS.

TELSMITH
COARSE AND SECONDARY CRUSHERS



Both the Telsmith Primary Breaker and the Telsmith Reduction Crusher possess these radical features of advantage:

(1) Non-crystalizing, unbreakable pillar shaft.

(2) Short, heavily metalled structure that will endure where a longer, looser frame will fail.

(3) Enormous bearings, with oil pressure lubrication and perfect exclusion of dirt.

(4) Parallel, gyratory crushing action—full stroke at the top of the head acting on the big lumps.

(5) Increased diameter of crushing bowl, with crushing surfaces of corresponding area.

(6) Free bottom discharge with no clogging on chute.

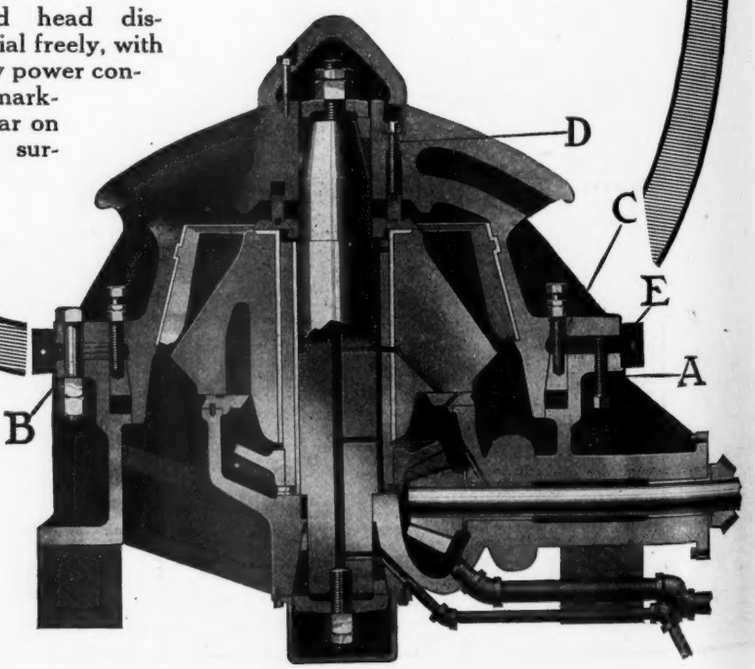
Then here are some points applying more particularly to the Reduction Crusher, although also embodied in the Primary Breaker:

(7) Minimum of fly-wheel effect to damage machine if tramp iron enters it.

(8) Open feed hopper, requiring neither hand nor mechanical feeding.

(9) Free bottom discharge by gravity, without centrifugal action and without plugging on discharge chute.

(10) Umbrella-shaped head discharges crushed material freely, with big output, very low power consumption and remarkably little wear on crushing surfaces.



Get Breaker Catalog No. 166 and Reduction Crusher Bulletin No. 2F11

Smith Engineering Works

3188 Locust St. Milwaukee

30 Church St., New York City. 110 W. Park Way, N. S., Pittsburgh, Pa.; 930 Oliver Bldg., Boston, Mass.; 325 W. Main St., Louisville, Ky.; Garfield Bldg., Cleveland, Ohio; Franklin and Channing Aves., St. Louis, Mo.; 208 N. Third St., Columbus, O.

It gets immediate attention if you mention ROCK PRODUCTS.

Hit Depreciation a Hard Blow!

Use Stroh Steel! Thereby your equipment replacements will be few and far between.

Stroh Steel is a metal cast in one operation by a patented process. The resultant casting has Stroh Alloy on the wearing surfaces around a body of carbon steel.

STROH STEEL

embodies "Strength—where necessary. Wear—where necessary. Cost—where necessary."

By the secret Stroh Process, the metal which must resist friction and service is made of the greatest wear-resistant steel known. To make a solid casting of it would necessitate a prohibitive cost. The Stroh Process solves the problem.

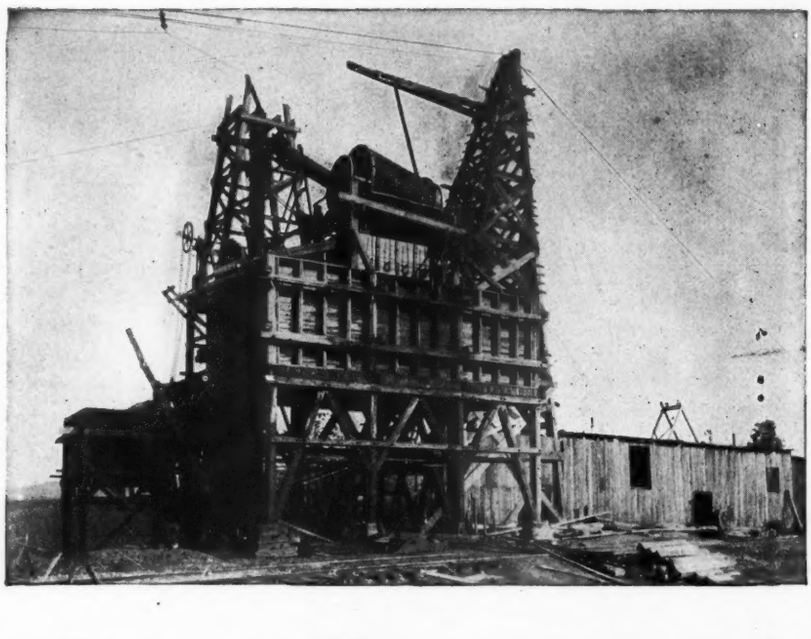
We manufacture Crusher Parts, Gears, Pinions, Sprockets, Cams, Car Wheels, Spindles, Bucket Teeth and other equipment.

Write for interesting booklet.

Stroh Steel Hardening Process Co.
Pittsburgh, Pa.
F. Lloyd Mark, Monadnock Bldg., Chicago, Ill.,
Western Representative

Webster Equipped

Sand and Gravel Plants



Engineered to provide commercial economy in operation and production

This company does more than manufacture good machinery.

Our engineers render the buyer of Webster Equipment a far reaching service.

The physical conditions of each sand and gravel plant site are studied. Likewise the market conditions.

Plants are designed that will do the work required at a minimum cost and in the most effective way.

The same form of service applies to elevating and conveying machinery for cement and chemical plants.

Upon request and without obligation to you Webster Engineers will study your requirements and make recommendations.

(263)

THE WEBSTER M'F'G COMPANY, TIFFIN, OHIO

New York Chicago

Sand and Gravel Plant Machinery, Screens, Conveyors, Feeders, Drives, Friction Clutches, Etc, Etc.

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.

Rock Products

TRADEPRESS PUBLISHING CORPORATION
542 SOUTH DEARBORN STREET
CHICAGO

Vol. XXII, No. 5 February 26, 1919

NATHAN C. ROCKWOOD
Editor

T. BIRCHLER
Assistant Editor

A. PERRIN
Manager

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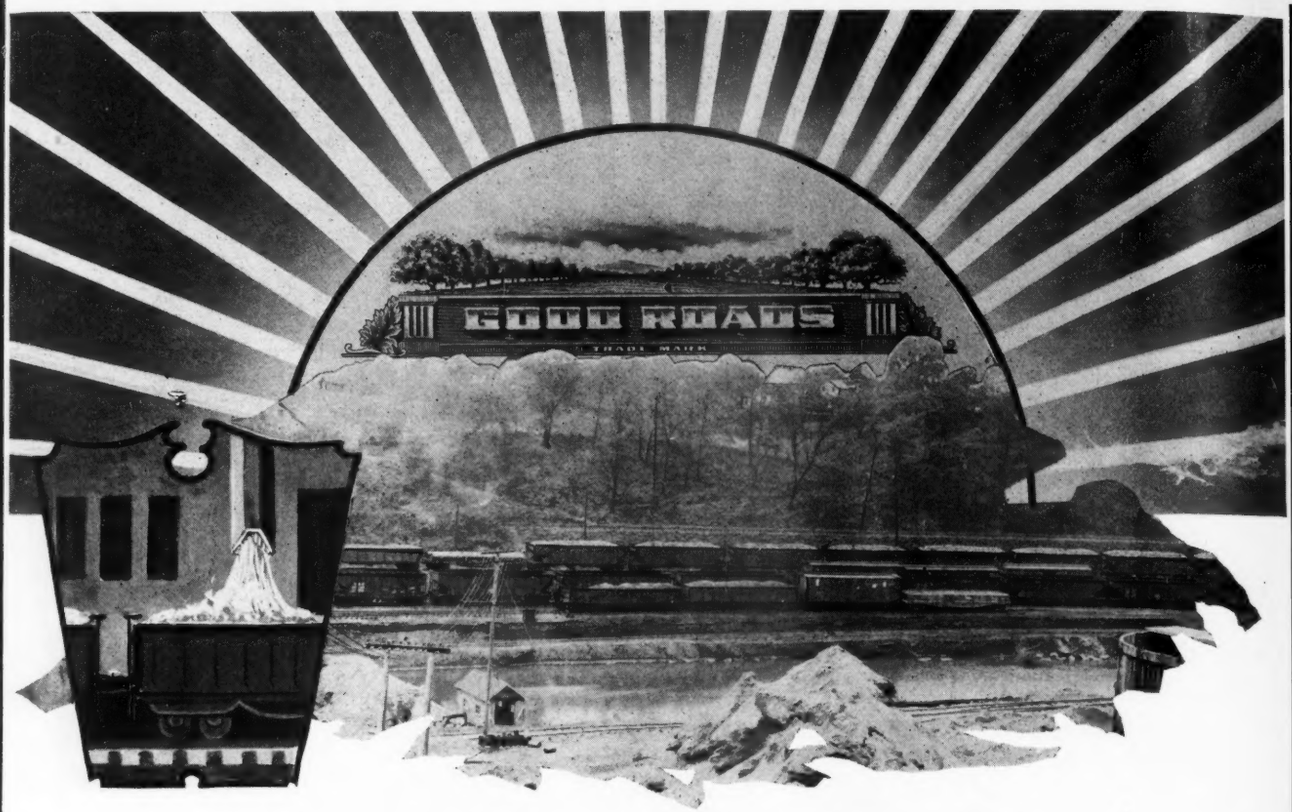

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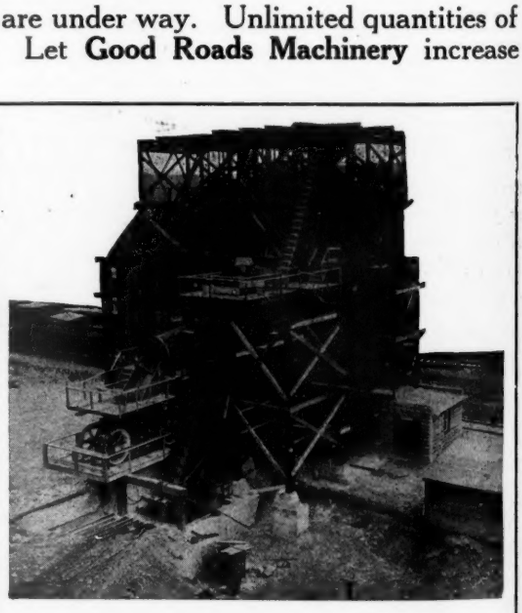

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Rock Products

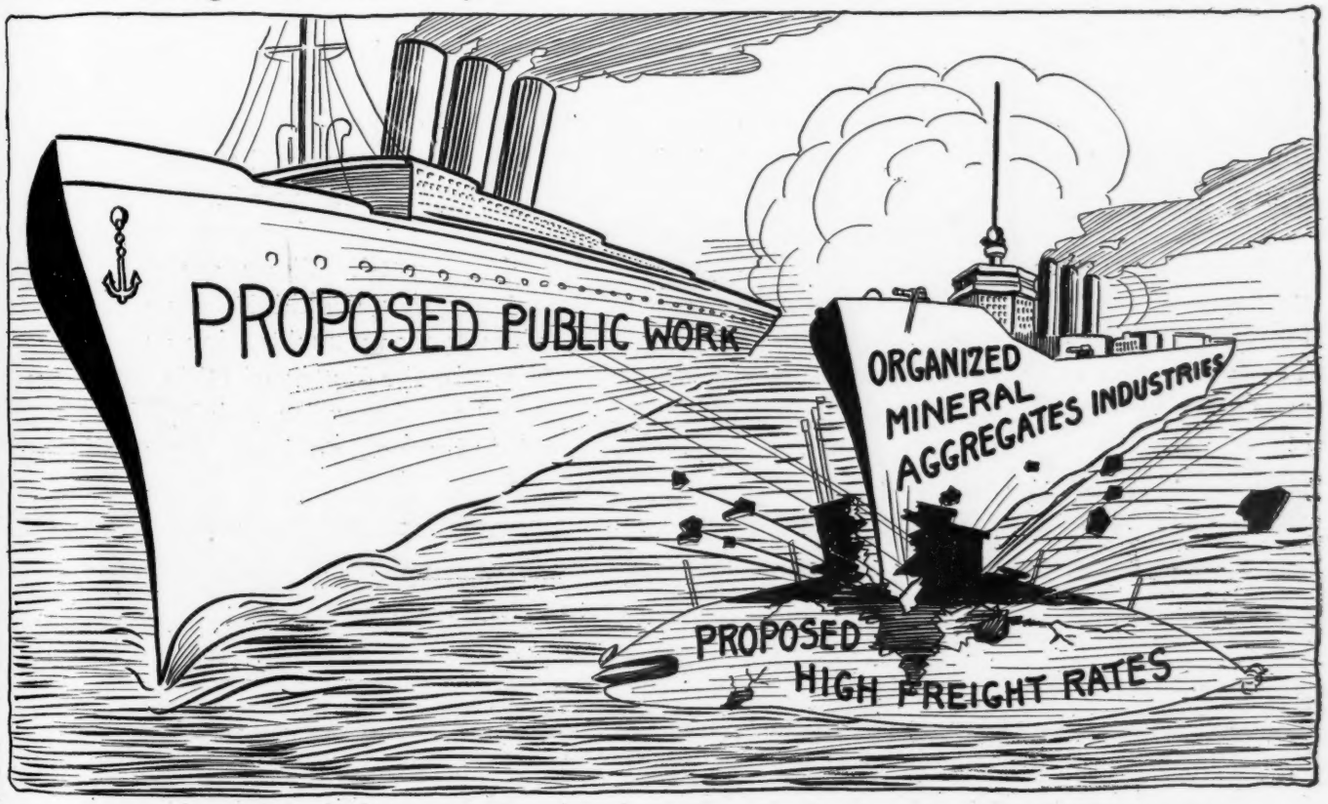
Vol. XXII | Chicago, February 26, 1919 | No. 5

Young Samson Begins to Feel His Muscle

Experience of Organized Mineral Aggregate Industries Reiterates Proof That in Union There Is Strength

TWO MEMORABLE CONVENTIONS of rock products producers have taken their place in history—the first, that of the sand and gravel men, at Chicago, January 28 and 29, memorable for the announcement of a proposed increase in railway freight rates on mineral aggregates; and the second, that of the crushed stone men at Buffalo two weeks later, February 11 and 12, memorable for the announcement that the Railroad Administration had no intention of putting such a rate schedule as that submitted at Chicago into effect *this* year.

This change of front by the Railroad Administration was due entirely to a victory by *organized* mineral aggregate producers. It is well known that the railway men submitted the proposed rate schedule at Chicago with every intention of putting it into effect at once, and that they were deterred from doing so only by the overwhelming evidence of opposition. And it is to the everlasting credit of the National Association of Sand and Gravel Producers that they were on the job in force to prevent an



ORGANIZATION WINS—BUT THE PRICE OF FUTURE SAFETY IS ETERNAL VIGILANCE

action which would have imperiled the industrial safety of the entire country.

Also, great credit is due the Ohio Macadam Association, the Ohio Sand and Gravel Producers' Association, the Indiana Crushed Stone Association and the Indiana Sand and Gravel Producers' Association for the prompt and effective way they got action by the legislatures of their respective states. You have got to take off your hats to these four local associations in not allowing any grass to grow under their feet, and they may well be held up as models for local associations everywhere.

Organized Effort Wins

The one big lesson learned in all this freight-rate controversy is merely the old, old adage of the efficacy of a united front. Only the existence of the two National Associations made this victory possible, and the extreme usefulness of active local associations has been fully demonstrated. Also, one big step has been taken in bringing the two National (or rather, including slag, the three National) Associations closer together.

But now is no time to sit back and congratulates oneself on the accomplishments of these organizations, although every producer may well be proud of them. The railway men have received a well-deserved set-back and the public is fully aroused to the danger threatened, but these railway men are only human, and to be thus checkmated in one of their most cherished plans will only tend to make them the more determined to carry out these plans eventually. Therefore, don't think for a minute that the organizations which have helped the whole industry so tremendously have no further usefulness. The game has only just begun. The future prosperity and safety of the industries lie ever in their eternal vigilance.

Moreover, what these organizations have done in fighting increases in freight rates is only the first evidence of their possibilities for promoting the welfare, not only of the mineral aggregate industries, but the prosperity of the entire country. At last the producers of these fundamental materials of construction have been brought to a realization of their rightful place in the national industrial program.

This Year's Rates Not Settled

Assurance has been given that the proposed mileage scale of the Central District will not be put into effect this year, but little encouragement has been given the hopes to reduce existing exorbitant rates. Nevertheless, it is reasonable to believe that the straight 20 cents a ton advance of last year can be made a 25 per cent advance on the previous rates, if sufficient pressure is exerted.

The excuse given for the 20 cents per ton advance rather than a 25 per cent advance, such as was made on other commodities, was that this was in line with the desires of the producers themselves; i. e., a 20 cents per ton advance would not change the existing differentials, while a per cent advance would. We do not recall that producers were ever consulted in the matter. If they really want the 25 per cent increase in lieu of the 20 cents per ton there is every reason to believe that they could now insist upon it successfully.

There is, of course, a chance that enough popular pressure can be brought to bear by state legislatures and public officials to have the 20 cents per ton increase cut in half or entirely eliminated. There are mighty good reasons why this should be done, but it can come about only by such action as has already been taken in the States of Ohio, Indiana and Illinois, where the entire weight of the state's political influence has been thrown into the controversy.

No Action Has Yet Been Taken on Agricultural Freight Rates

NOTHING has developed yet in regard to the proposed mileage scale for agricultural limestone freight rates. It is believed that railway officials are not enthusiastic for pushing these mileage scales at this time.

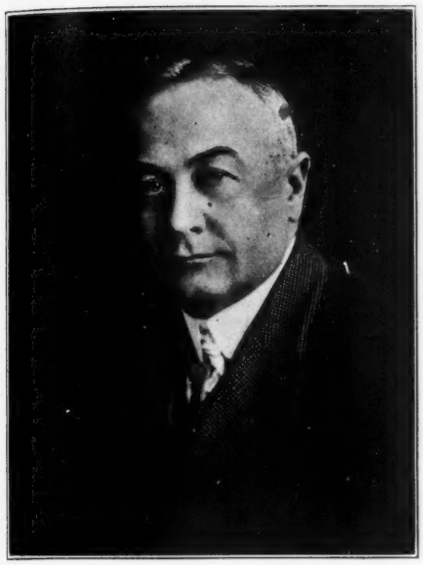
It will be well for all agricultural limestone producers to be on their guard, however, as a proposed new scale may be announced most any day. Obviously the course of action to pursue is to enlist the help of the state departments and bureaus of agriculture and the state agricultural experiment stations.

Before the Government took the railways on some of the lines in the South special very low rates were often made in favor of agricultural lime and limestone for the specific purpose of stimulating agricultural production. An effort should be made to find the railway men who made these rates, for they are already won over to the cause.

However, it behooves all producers to be prepared and to be working now with the proper authorities to prevent the proposed schedule from coming up again.

Crushed-Stone Men Receive Assurance of No Freight Rate Increase This Year

Buffalo Convention a Huge Success and Everybody Returns Home Happy—National Crushed Stone Association Already on a Prosperous Basis



A. J. Blair, president of National Crushed Stone Association

BUFFALO WELCOMED THE CRUSHED STONE MEN with characteristic heartiness. Mayor Buck was on hand with an address of welcome and other local celebrities made addresses at the various sessions of the convention. Many interesting topics were discussed formally and informally, but the one big topic which interested every one of the 130-odd stone men there was FREIGHT RATES.

This was the first subject on the program and F. T. Gucker of the John T. Dyer Quarry Co., Philadelphia, led off with an account of what the Eastern Stone Producers' Association had been doing to get rates based on the Birdsboro Stone Co. decision of the I. C. C. put into effect. (The history of the Birdsboro Stone Co. case was given in ROCK PRODUCTS of September 11, 1918, and subsequent matter in the issues of December 18, 1918, and January 29, 1919.) The Eastern Association has all the time been trying to make the railway officials see how higher freight rates will add to the cost of ballast production, but as John Rice, of the General Crushed Stone Co., Easton, Penn., said there exists so little sympathy and co-operation between the maintenance-of-way and traffic departments, that results along this line have not been remarkable.

Great Variety of Freight Rates

The discussion very early developed the fact that there could be no agreement on a basis of rates between Eastern and Middle West producers for the reason that the Eastern rates are already in many cases in excess of the proposed schedule for the central District. While many Central West producers would be satisfied to have the present rates let alone, Eastern men, like B. D. Pierce, Jr., of the Connecticut Quarries Co., New Haven, were very far from being satisfied with a present rate of 80 cents a ton for less than a mile haul.

Also it seems that in the East the rates on sand and gravel, for some unknown reason, are considerably less than the rates on crushed stone, while in the Central West the rates are in most instances identical. These are only a few of the many local problems brought up which emphasized the great difficulty of ever finding a solution of the freight-rate question which will satisfy everyone. Some few were in favor of a ton-mileage basis of rates, but the majority were strong for continuing the present rate structure.

U. S. Railroad Administration
Director General of Railroads
Washington, D. C.

Division of
Public Service Feb. 11, 1919.
Max Thelen, Director. File 20567.

Mr. A. P. Sandles, Secretary, National Crushed Stone Ass'n, 405 Hartman Building, Columbus, Ohio.

Dear Sir:

Your letter of February 3rd.

Owing to reorganization and change in office quarters, your communication was not replied to as promptly as it should have been, but I hope it was a source of some satisfaction to know that there will be no further increases, as increases, in rates on sand, stone, gravel and other road building materials.

The scale of rates submitted for consideration in Central Territory by the shippers and committees on September 30 was done so without the knowledge of this Division, and I understand that its further consideration has been abondoned.

Yours very truly,
(Signed) MAX THELEN,
Director.

A. P. Sandles, secretary of National Crushed Stone Association

Owing to this difference of opinion and to the prominence given local examples, it was impossible to arrive at any conclusion on the floor of the convention and the whole matter was intrusted to a committee composed of the following members: John Rice, chairman; A. F. Eggleston, Meriden, Conn.; R. N. Wallace, Bayport, Mich.; R. B. Tyler, Louisville, Ky.; E. J. Krause, St. Louis, Mo.; Edward Hely, Cape Girardeau, Mo.; F. W. Schmidt, Morristown, N. J.; C. M. Hunter, Roanoke, Va.; Charles Lourey, St. David, Ont.; Fred E. Ellis, Peabody, Mass.; I. S. Tinker, New Haven, Conn.; F. T. Gucker, Philadelphia; W. L. Sporborg, Syracuse, N. Y.; L. H. Hawblitz, Toledo, Ohio; E. T. Paul, Lewisburg, Ohio; Robin Boyle, Toronto, Ont.; A. J. Sullivan, Chicago; A. J. Blair, Milwaukee, and A. L. Norton, Albany, N. Y. This committee after much discussion finally drafted the resolution accompanying this article.

Secretary Sandles read the letter,

printed elsewhere, from Max Thelen, Director of Public Service of the Railroad Administration, disclaiming any intention to make rate increases on sand, gravel, crushed stone and slag as increases.

Railroad Administration Official Says No Increases This Year

At Secretary Sandles' request the Railroad Administration sent R. C. Wright, assistant director of the division of traffic, to Buffalo to explain to the convention just what the Administration intended to do about the proposed new rate schedule. Secretary Sandles placed Mr. Wright in front of the audience, read him the resolution of the Association's freight traffic committee and gave him some other points of the crushed stone men's case.

Mr. Wright was very affable and very soothing in his manner of acquitting himself. So far as the proposed mileage scale—which created such a storm of protest at Chicago—was concerned he assured the stone men that it never had been the intention of the Railroad Administration to put it into effect **this year.** It was merely a **feeler** to see how the industry felt about the scheme! He assured his listeners that the present rates would not be increased **this year,** but that there would be adjustments in some cases. New rates established between points where there was no existing published rate would, he said, probably be computed on a mileage basis.

Mr. Wright admitted that although the railways were now operated as one in policy, uniformity in all things could be carried too far. He said that the agitation for a uniform mileage scale was the result of the strong pressure constantly being brought to bear to reduce certain rates by quoting the lowest rate that could possibly be found to fit the conditions.

Railroads Crave Confidence of Shippers

The big problem of the railroads today, Mr. Wright said, was to win back the confidence of the people served. He assured his hearers that there never was any intention to put into effect any scale of rates arbitrarily; that the proposed rates would always have been given to the shippers for their consideration first; that there would be no secrets in the railway business of the future; that the railway men were anxious and willing to lay their cards on the table at any and all times. He urged the producers present to take up their problems and misunderstandings with the traffic officers of their local railroads. He urged them to get freight rates early on all prospective contracts for this season.

The railways, he said, were anxious to promote business in every way, from selfish motives as well as patriotic. He regretted that local traffic men were not more in sympathy with the new order of things and asked all the shippers present to do their part in educating them.

Secretary Sandles then brought up the matter of the proposed two-line haul charges. He went into some detail on the hardships suffered by road contractors during the war because of the sudden increases in freight rates, and stated that much damage had already been done the 1919 road-building program by the promulgation of the proposed mileage scale of rates. In replying, Mr. Wright expressed regret for the damage done and reiterated that there would be **no general reconstruction of rates this year.**

Secretary Sandles then urged a reduction in present rates; realizing that the railways needed more revenue and knowing that nearly every other industry was also clamoring for lower freight rates, he brought out the facts that the so-called 5, 15 and 25 per cent increases were in effect 80 to 100 per cent increases in freight rates on crushed stone, and that the existing rates were made specifically to discourage construction during the war.

Mr. Wright stated that the 5 and 15 per cent advances had been thoroughly thrashed out and that there was no chance of their being modified in any way. As to the 20 cents per ton increase, he said, it had been made for revenue and that the railway men had done their best to distribute the burden equitably—that the increases represented the result of the best judgment obtainable at the time. He said the flat increase of 20 cents per ton was done purposely in the interests of producers to preserve existing differentials. He said this method of flat rate advance had been endorsed by the Interstate Commerce Commission.

Comparisons with freight rates on other bulk commodities of much higher price, like pig iron or coal, Mr. Wright said, had no bearing on the subject. He said it would be impossible to predicate a freight rate schedule based on the value of the commodity. The only comparisons admitted would be those with which the commodity competed. Mr. Wright admitted that the railways kept no cost sheets on the handling of various commodities. He did not give much encouragement to any hopes of reducing present rates and when pinned down to a specific point the most that he could say was that **so far as the division of traffic was concerned there was no intention to make increases this year.**

Good Ballast Year in Sight

One of the questions asked Mr. Wright was the prospects of the present season for ballast orders from the railways. In reply he stated that of the $10,000,000 appropriatied for track ballasting in 1918 only $4,500,000 was actually expended. In addition to this unexpended balance of $5,500,000, an appropriation of $6,000,000 had been made for 1919, making a total of $11,500,000. If this sum of money is actually expended in 1919 it will make the biggest ballast year in history.

Selling and Operating Problems

The open-price system of competition as practiced by the Eastern Stone Producers' Association was described by detail by H. B. Allen, secretary. The question was raised as to the propriety of giving the names of the parties to whom quotations were made as well as the price quotations themselves, and in answer to this John Rice, President of the Eastern Association, stated that this course was absolutely fundamental to the results to be obtained. In other words, all the good that came from open-price competition was the result of mutual trust and confidence in one another, and that to start out on the assumption that your competitor could not be trusted with this information was to defeat the very object of the whole system.

Mr. Allen gave numerous instances to show how the operation of this plan by his association had resulted in eliminating misunderstanding and in doing much to promote good felowship. Prices by no means agree under such a system, carried out in the right spirit, but generally when a price much lower than the prevailing price was quoted the producer making the quotation gave the details which would justify his quotation. Often where a surplus has existed which must be marketed the other interested producers were given the first opportunity to dispose of it, with an allowance of 5 or 10 cents a ton for the trouble involved.

By a frank, open-handed policy with the railways in demonstrating collectively the increased cost of operation, the Eastern producers have been able to advance the price of ballast commensurate with the price of commercial stone. In a great many other ways the advantages of membership in the association have been demonstrated many times over.

Labor problems—welfare work, piece work, bonus systems, wage scales, etc.—came in for a good share of discussion. F. W. Schmidt of Morristown, N. J., recommended giving the quarry laborers enough land so that they could have home gardens and a permanent abode. He said bonus and piece work systems were hard to operate successfully be-

cause of the difficulty in getting the whole organization to work together; however, he said, the fault was more with the individual organization than with the system. Mr. Schmidt said, and his views seemed to be generally accepted, that labor must have fairer treatment than has been its lot in the past, and that industry could well afford to make a great sacrifice at this time to promote harmony.

Several members gave their experiences with bonus systems. It was generally agreed the scheme must include all employees of the plant to be really effective. It was also pretty generally agreed that the bonus allowance must be based on a weekly or monthly average rather than a daily output, because on a daily basis the tendency is to overload the plant one day and run light the next. Little experience in profit sharing was given.

The marketing of screenings was discussed by E. C. Dunbar of the Dunbar Stone Co., River Rouge, Mich. As full details of Mr. Dunbar's plant and methods will be published in Rock Products of March 12th, this matter will be passed over here.

The use of the national organization to exchange and dispose of surplus machinery and operating equipment was discussed, and it was voted to try out the plan. The association will receive a commission of 2 per cent from the seller for all machinery thus disposed of.

Co-operative insurance, fire and liability, was discussed by D. C. Souder of the France Stone Co., Toledo, and W. L. Sporborg of the Rock-Cut Stone Co., Syracuse. Through the courtesy of the Lime Association the entire cost-accounting system developed by that association at the expense of several thousand dollars has been given gratis to the crushed stone industry. J. J. Urschel of the Woodville Lime Products Co., Toledo, was on hand from the Lime Association to explain, with the assistance of the Association's accountant, Mr. Martin, the whole workings of the new cost system.

Changes in the Constitution Adopted

The Constitution of the association was amended so as to make any producer, anywhere, eligible for membership. Hitherto such membership could be only through the local associations, where one existed. To represent these individual members in the management of the Association, seven directors at large are to be chosen annually. The membership dues were voted to be levied on railway ballast and blast-furnace flux as well as on commercial stone. Hitherto the two former were exempt from the annual tonnage assessment of 1/10c per ton. The president and vice-presidents are now elected by vote of the convention, instead of by delegates of the district organizations as before. Other minor changes were made.

Officers of the National Crushed Stone Association

President—A. J. Blair, vice-president and general manager, Lakeshore Stone Co., Milwaukee, Wis.

First Vice-President—John Rice, president, General Crushed Stone Co., Easton, Penn.

Second Vice-President — D. B. Pierce, Jr., president, Connecticut Quarry Co., New Haven, Conn.

Treasurer—A. J. Sullivan, vice-president and general manager, United States Crushed Stone Co., Chicago, Ill.

Secretary — A. P. Sandles, 405 Hartman Bldg., Columbus, Ohio.

Successful Banquet

The first annual banquet of the Association at the Hotel Iroquois, Feb. 12, was up to the usual Sandles' standard. Addresses were made by John Rice, vice-president of the Association; Maj. William M. Acheson, formely of the U. S. Engineers, Expeditionary Force in France; Andrew H. Phelps, Chamber of Commerce of the United States, New York City; Guy Miller, U. S. Bureau of Public Roads, and other notable men both in and out of the crushed stone industry.

Maj. Acheson's talk dealt largely with the remarkable achievements of American men and American equipment and machinery in France. Prior to the war and the introduction of American equipment, he said, the average output of an English quarry was 9.7 cu. yd, of crushed stone per man per week. The French per man per week production was even less. Maj. Acheson also brought out the fact that most of the 300,000 cu. yd. of crushed stone used on the English front was brought across the Channel from England.

Mr. Phelps of the Chamber of Commerce of the United States announced that the Chamber was soon to have a standing committee on highways. Mr. Phelps was also present at one of the sessions of the convention at which it was unanimously voted to have the National Crushed Stone Association join the Chamber of Commerce of the United States.

Election of Officers

A nominating committee consisting of A. Acton Hall, Ohio, chairman; F. W. Schmidt, E. J. Krause, W. Scott Eams and Robin Boyle, unanimously reported in favor of continuing the present officers, with the exception of one of the vice-presidents. These officers are given elsewhere. The following were elected directors at large: R. B. Tyler, Louisville, Ky.; Edward Hely, Missouri; C. D. Brewer, Duluth, Minn.; F. W. Bilger, Oakland, Cal.; W. Scott Eams, New Haven, Conn.; Thos. McCroskey, Knoxville, Tenn.; and A. Acton Hall, Ohio. Directors to represent the affiliated local associations will be elected later by the associations.

Louisville Next Convention City

The Board of Directors met following the convention and unanimously selected Louisville, Ky., as the next convention city. R. B. Tyler extolled the virtues of Louisville and Kentucky so eloquently that every one is looking forward to one grand three-day convention, etc. Make your hotel reservations now for there is going to be a big crowd.

U. S. Senator Introduces New Federal Aid Road Bill

WASHINGTON, D. C.—Calling for an appropriation of $425,000,000, a bill to assist the states in the building of highways has been introduced into Congress by Senator Townsend, of Michigan. Of this fund, $50,000,000 would become available July 1, next, $75,000,000 on July 1, 1920, and $100,000,000 on July 1 of each of the succeeding three years.

"Our Government has entered the good-roads field, and it will not retire therefrom," said Senator Townsend. "It is my desire to assist in directing the Federal activities along lines at once scientific and practical. I believe that the National Government should construct a natonal system of roads through the states connecting all the commonwealths, and then should maintain these roads, and the states should construct and maintain all the other roads within their boundaries."

The measure provides for a Federal highway commission of five members, which shall determine the types of construction and reconstruction and the character of improvement, repair and maintenance of all highways included in the proposed National Highway System. Methods of apportionment of money among the States are laid down as well as restrictions concerning the building of roads in and near cities.

Resolutions of Crushed Stone Convention on Freight Rates

WHEREAS, The development and growth of the crushed stone industry, in large part, was the result of encouragement by railroads to procure ballast, and

WHEREAS, Such plants were located with reference to certain markets and under certain freight rates which rendered their operation successful at the time of construction, and

WHEREAS, These various plants were located with reference to certain competitive conditions and present locations with respect to the matter of freight rates now constitutes a vested right, which should not now be destroyed or disturbed, and

WHEREAS, There is now a great demand for road building, and

WHEREAS, The present excessive rates are, in many instances, equal to or greater than the actual cost of producing stone, which will cause a great reduction in amount of building and public improvement, by reason of such excessive freight rates, that the only alternative will be the installation of small crushing plants along the various highways to be improved, and which once established, will in many instances permanently remain, thereby, for a long time or forever, destroying the market heretofore available to the present installed plants.

The further consequence of the loss of this commercial business, will not only be the loss of the freight revenue to the roads, but will increase by approximately fifty per cent the cost of the remaining production which is ballast, and thereby result in serious injury to the railroads, both from the standpoint of maintenance and traffic, destruction to the investment of the stone producers and ultimate increased cost of road material to the public; therefore,

1st. BE IT RESOLVED, That the tariffs applying on crushed stone shipments in effect in 1914 be used as a basis for a reduction on the freight rates from the present excessive and exorbitant rates on this commodity, and that increased rates, if any, over those in effect in 1914, be imposed so as not to disturb the relative situation as far as shippers are concerned, and not to destroy the vested rights of capital invested under conditions existing in and prior to 1914; and

2nd. BE IT RESOLVED, That early action be taken by the Department of Railroad Control to reduce the present excessive rates, so as to enable highway engineers and architects to make intelligent and accurate estimates on public and private improvements and construction, and to give assurance to bidding contractors that they will not have to meet added and ruinous freight charges as were imposed upon them during the war period; and

3rd. BE IT RESOLVED, That since the present excessive freight rates were imposed upon road and building materials as purely a war emergency measure, and the men engaged in the crushed stone industry, in order to assist in winning the war, submitted to and acquiesced in said rates for the war period, now plead for a reduction of these war freight rates to a basis that will permit, not halt, the return and revival of the building and construction activities of the nation; and

4th. BE IT RESOLVED, That the National Crushed Stone Association approve the protests and recommendations made by State Legislatures, Civic Organizations and Public Officials against excessive freight rates on highway building material, and we urge all members of this Association to have their own state legislatures to take similar action, and

5th. BE IT RESOLVED, That we commend the efforts of the United States Department of Labor in its activities to promote a great program of highway and building improvements so as to act as a shock absorber of idle labor and to employ the thousands of returning soldiers, thereby helping to preserve the peace, prosperity and contentment of this nation; and

6th. BE IT RESOLVED, That we believe that the present excessive freight rates, made as a war measure, if continued, will prevent public officials from going forward with public improvements, thereby halting and handicapping revival of industrial activities, and increasing the army of the unemployed and giving encouragement to the Red Flag propaganda, and lessen the revenues of railroads, and increasing the cost of railroad ballast, and in general tend to imperil the welfare of this nation.

Registration at National Crushed Stone Association Convention, at Chicago, Illinois, February 11-12, 1919

James Savage, Buffalo Crushed Stone Co., 1097 Ellicott Square, Buffalo, N. Y.
R. B. Tyler, R. B. Tyler Stone Co., 114 Fourth street, Louisville, Ky.
W. R. Sanborn Lehigh Stone Co., Bank Bldg., Kankakee, Ill.
Robert N. Wallace, Wallace Stone Co., Bayport, Mich.
L. J. Boxley, W. W. Boxley & Co., Roanoke, Virginia.
W. L. Sporborg, Rock-Cut Stone Co., 531 Union Bldg., Syracuse, N. Y.
Will S. Davidson, Davidson Bros., Gouveneur, N. Y.
J. L. Heinreich, LeRoy Lime & Crushed Stone Corp., LeRoy, N. Y.
S. M. McKeown, Queenstown Quarry Co., Ltd., St. Davids, Ont., Can.
B. R. Babcock, The Callanan Road Improvement Co., P. O. Box 409, Albany, N. Y.
W. R. Harris, Island Slag Co., Ellicott Sq. Bldg., Buffalo, N. Y.
Leslie J. Bennett, Buffalo Cement Co., Ltd., 110 Franklin street, Buffalo, N. Y.
Chas. A. Freiberg, Buffalo Cement Co., Ltd., 110 Franklin street, Buffalo, N. Y.
A. J. Hooker, Buffalo Crushed Stone Co., 1097 Ellicott Square, Buffalo, N. Y.
L. H. Hawblitz, France Stone Co., 1800 2d Nat'l Bank Bldg., Toledo, Ohio.
J. S. Hardesty, Island Slag Co., 742 Ellicott Square, Buffalo, N. Y.
A. J. Blair, Lakeshore Stone Co., P. O Box 175, Milwaukee Wis.
E. J. Krause, Columbia Quarry Co., 710 Fullerton Bldg., St. Louis, Mo.
C. P. Tigges, Columbia Quarry Co., 710 Fullerton Bldg., St. Louis, Mo.
Edward Hely, Cape Girardeau Mo.
John Rice, General Crushed Stone Co., Brake Bldg., Easton, Penn.
H. H. Mitchell, General Crushed Stone Co., Drake Bldg., Easton, Penn.
O. M. Graves, General Crushed Stone Co., Drake Bldg., Easton, Penn.
A. L. Scott, General Crushed Stone Co., LeRoy, N. Y.
J. L. Faylor, General Crushed Stone Co., Akron, N. Y.
Geo. F. Shafer, General Crushed Stone Co., Cutler Bldg., Rochester, N. Y.
F. T. Gucker, The John T. Dyer Quarry Co., Harrison Bldg., Philadelphia, Pa.
D. C. Souder, France Stone Co., 1800 2nd Nat'l Bank Blg., Toledo, Ohio.
Arthur F. Eggleston, John S. Lane & Son, 35 Colony street, Meriden, Conn.
A. L. Sheffer, National Limestone Co., Naginey, Penn.
L. J. McNitt, National Limestone Co., Naginey, Pa.
W. Scott Eams, New Haven Trap Rock Co., 67 Church street, New Haven Conn.
F. W. Schmidt, Jr., Morris County Crushed Stone Co., 17 South street, Morristown, N. J.
L. C. Bonnell, Commonwealth Quarry Co., Summit, N. J.
I. W. Wortman, North Jersey Quarry Co., 17 South street, Morristown, N. J.
Willard D. Robinson, Toledo Stone & Glass Sand Co., 629 Ohio Bldg., Toledo, O.
F. W. Schmidt, North Jersey Quarry Co., 17 South street, Morristown, N. J.
William Dahm, Belmont Gurnee Stone Co., North Bergen, N. J.
A. A. Hall, Ohio Marble Co., and Stone Products Co., Piqua, Ohio.
Clyde Calvin, Bessemer Limestone Co., 714 Stambaugh Bldg. Youngstown, Ohio.
J. A. Moore, Higgins Stone Co., Bellevue, O.
A. L. Norton, Norton Stone & Lime Co., 90 State street, Albany, N. Y.
H. B. Allen General Crushed Stone Co., North American Bldg., Philadelphia Penn.
Fred E. Ellis, Essex Trap Rock & Const. Co., Peabody, Mass.
James Reid Callanan, Callanan Crushed Stone Co., 25 North Pearl street, Albany, N. Y.
F. J. O'Mealia, LeRoy Lime & Crushed Stone Corp., LeRoy N. Y.
E. T. Paul, Bluffton-Lewisburg Stone Co., Lewisburg, Ohio.
Ralph E. McLean, East St. Louis Stone Co., Arcade Bldg., East St. Louis, Mo.
Arthur S. Savage, Buffalo Crushed Stone Co., 1097 Ellicott Square, Buffalo, N. Y.
Geo. H. Stein, Toledo Stone & Glass Sand Co., 629 Ohio Bldg., Toledo, Ohio.
C. M. Hunter, W. W. Boxley & Co., First Nat'l Bank Bldg., Roanoke, Va.
E. C. Dunbar, River Rouge Stone Co., River Rouge, Mich.

H. J. Swonger, Barber Asphalt Pav. Co., Fillmore and E. Delmar avenue, Buffalo, N. Y.
H. M. Martin, Barber Asphalt Pav. Co., Fillmore and E. Delmar avenue, Buffalo, N. Y.
H. E. Bair, France Stone Co., 1800 Second Nat'l Bank Bldg. Toledo, Ohio.
F. W. M. Hammerschmidt, Elmhurst-Chicago Stone Co., Elmhurst, Ill.
H. H. Hodgkin, Gouverneur Limestone Co., Gouverneur, N. Y.
W. E. Foote, Wickwire Limestone Co., Buffalo, N. Y.
H. C. Lane, John S. Lane & Son Inc., Meriden, Conn.
B. D. Pierce, Jr., Connecticut Quarries Co., 6 Church street, New Haven, Conn.
I. S. Tinker, Connecticut Quarries Co., 6 Church street, New Haven Conn.
P. James Kelly, Connecticut Quarries Co., 6 Church street, New Haven, Conn.
A. L. Worthen, Connecticut Quarries Co., 6 Church street, New Haven, Conn.
F. C. Douglas, Fetch & Douglas 511 Cutler Bldg., Rochester, N. Y.
Fred H. Becker, Becker Limestone Co., Lincoln Park, N. Y.
A. J. Sullivan, U. S. Crushed Stone Co., 108 S. La Salle street, Chicago, Ill.
D. Hyman Empire Limestone Co., Fourth and Hudson streets, Buffalo, N. Y.
M. S. Hiland, C. B. Whitmore Co., 30 Market street, Lockport, N. Y.
W. E. Tummon, Quinlan & Robertson, Ltd., Crookston, Ont. Can.
J. B. Hart, Canada Crushed Stone Co., Dundas, Ont., Can.
Sam Oliver, Oliver Rogers, Ltd., Owen Sound, Ont., Can.
Robt. Hambleton, Hagersville Crushed Stone Co., Hagersville, Ont., Can.
J. F. M. Stewart, Provincial Stone Co., McKinnon Bldg., Toronto, Ont., Can.
Frank Rogers, Oliver Rogers, Ltd. 1193 Queen street, W., Toronto, Ont., Can.
C. M. Doolittle, Canada Crushed Stone Corp., Dundas, Ont., Can.
Robin Boyle, Provincial Stone Supply Co., Ltd., Toronto, Ont., Can.
B. F. Fowler, Wentworth Quarries, Ltd., Vinemount, Ont., Can.
G. W. Essery, Crushed Stone, Ltd., 47 Yonge Arcade Toronto, Can.
F. W. Schwindimox, Wentworth Quarries, Ltd., Vinemont, Ont., Can.
H. C. Whitmore, C. B. Whitmore, Ltd., 30 Market St., Lockport, N. Y.
E. E. Whitmore, C. B. Whitmore, Ltd., 30 Market street, Lockport, N. Y.
Chas. Lourey, Queenstown Quarry Co., St. David, Ont., Can.
H. W. Young, Buffalo Cement Co., 110 Franklin street, Buffalo N. Y.
F. C. Diebold, Buffalo Cement Co., 110 Franklin street, Buffalo, N. Y.
C. A. Morris, American Lime & Stone Co., Tyrone, Pa.

Six States Half Billion Behind in Building

IT WILL TAKE approximately $500,000,000 expended in buildings in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and New York to make up the building deficiency incident to the war. This construction work must be in addition to the normal, current requirements of 1919, according to the Information and Education Service of the U. S. Department of Labor, which has issued the results of a study of building needs in these six states, made by the Economics Section of the Division of Public Works and Construction Developments.

Nine cities form the basis for the figures in New York State and from the actual decreases in building activities in these it is estimated that New York's building deficiencies for 1917 and 1918 are not less than $236,000,000. Massachusetts shows up $214,000,000 short, the basis for the computation being actual falling off in the building permits in seven important cities of which Boston is one.

Help Promote Road Improvement Enthusiasm in Your Own State

Sluggishness in Starting Work Must Be Overcome at Once

REPORTS from the information and education service of the Department of Labor at Washington state that "less than 45 miles of roads have been completed by States availing themselves of Federal aid. Appropriations made by Congress to pay the Federal Government's proportion of the cost of State road building projects now total $48,500,000. This soon will be increased materially. An addition of $200,000,000 probably will be available during the next 3 years.

"With these millions available and with the approval of the Federal Government on 760 road-building projects, involving 7,869.61 miles of roads, less than 45 miles of roads have been constructed under the Federal Aid plan."

Undoubtedly much of this delay has been caused by the Federal Bureau of Public Roads. However, at this time the Bureau is apparently in a mood to cooperate with the Department of Labor to hasten prospective construction work, and any delay will be largely the result of sluggishness on the part of state and local highway authorities to take advantage of their opportunities.

With the facilities and arguments placed at their disposal by the Department of Labor every organization of rock product producers can be a power in its own locality for getting this work underway. Every individual producer can be of some assistance. And it is a patriotic duty for them to do so.

High Prices Must Not Delay Work

Do not allow your local highway officials to avoid the issue on the ground of high prices. You have the Department of Labor behind you in defending the present high prices as follows: "The Department of Labor does not deny that road materials and labor costs are high. Rather, the Information and Education Service asserts, indications are that prices will remain high for some time to come, and, in view of the forecasts for market conditions, it is imprudent to longer hold up State construction anticipating lower construction costs.

"If the various States would get under way such road-building projects as have been approved by the Federal Government, $56,171,846 would be spent for better roads and, if the construction costs are higher than in pre-war times, the actual financial outlay for the States need not be higher, since approximately half of the bill would be paid by the Federal Government.

"There have been set aside to cover the Federal Government's portion of the costs on the 760 road projects approved in various States, more than $21,000,000. This now is available for States which will go to work on their road construction on plans approved by the Federal Government.

"The information and education service, through the Division of Public Works and Construction Developments of the U. S. Department of Labor, emphasizes the fact that with more than $45,000,000 now appropriated by Congress for Federal aid in road building, less than 45 miles of roads have been completed under the Federal Aid plan. Such States as have been allotted Federal aid on approved projects, the Department submits, are in position to give general business a great stimulus and to effectively combat the ills incident to general unemployment, by immediately getting the road-building work under way."

A status of Federal aid projects in your own state will be furnished by the Department of Labor on request and every rock products producer is urged to appoint himself a committee of one for his locality to help the good work along.

Castalia Portland Cement Co. Is Re-Organized

CASTALIA, O.—Reorganization of the Castalia Portland Cement Co. of Castalia, following the lifting of the receivership, has been completed and G. W. Hackett of Pittsburgh, who has been receiver is again in direct charge as president. New interests now have representation in the organization, J. T. Brooks of Pittsburgh having been elected vice president and treasurer. Miss Hume of Pittsburgh was re-elected secretary. New members of the board of directors are Howard Brown and Walter Kirkpatrick, who are directly connected with the plant here.

"We expect to get started by March 1, and to operate to full capacity," said Vice President Brooks today. "It looks like a big year for cement, with heavy demands for building and road construction."

Operation of Quarries and Crushing Plants

III—Types of Crushers—Jaws, Gyratories and Rolls

By R. W. Scherer
Supt. of Quarries, Union Lime Co., Milwaukee, Wis.

THE AMOUNT OF WORK done by a breaker can be fairly well measured by the planes of breakage that need to be made in reductions of a certain ratio. Assuming that odd shapes, the variations from the cube, are the same in small as in large pieces, a comparison of the surface areas of breaks in the rock necessary to produce a certain ratio of reduction in cubes will be a measure also of the areas broken in odd-shaped pieces. In cubes we find that in a 5 : 1 reduction 12 cleavages are necessary, each having an area of 5 x 5 whatever the unit of measurement, as shown in Fig. 1. The total area of breakage is 12 x 5 x 5 equals 300.

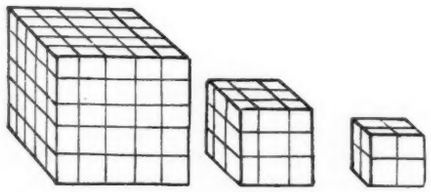


Fig. 1—Illustrating cleavages in reduction process

In a 3 : 1 reduction there are six breaks necessary, each having an area of 3 x 3 of the unit of measurement and the total surface of breaks is 6 x 3 x 3 equals 54. While in a 2 : 1 reduction, breaking to the same unit, there are only three planes, each 2 x 2 and the total area of breaks is 12. But it takes nearly five pieces of the 3-in. stone to equal one of 5-in. and it takes more than 15 of the 2-in. pieces. So that if the quantity of stone fed to a machine is gauged by tons, the machine reducing to the final size from pieces of twice that size must break 15 pieces to one piece broken in a 5 : 1 reduction. Adding these ratios to the problem the comparative amount of work done by crushers is fairly well measured by the following comparison:

In 5 : 1 reduction: 300 breakage areas, 1 piece equals 300.

In 3 : 1 reduction: 54 breakage areas, 4.62 piece equals 250.

In 2 : 1 reduction: 12 breakage areas, 15.62 piece equals 187.

Importance of Suitable Machines for Final Reduction

This comparison, theoretical though it is, shows what a large proportion of the total work of crushing consists in the final reduction to maximum size and the advisability of making this final reduction in suitable machines. Remembering that the capacity of any plant for producing stone of a given maximum size depends on the length and speed of the crushing edges actually engaged in the final reduction, it becomes apparent why a plant producing a certain amount of 2-in. stone will scarcely produce half that amount of 1½-in.

Ratio of reduction is an essential consideration, but further than that, the actual sizes in inches from which and to which the material must be reduced, determine the type and size of machine that is best suited for the work. Of the three types of breaking machines in general use, jaw crushers, gyratories, and rolls, each has its advantages and limitations and a recapitulation of these will help in solving crushing problems.

Jaw Crushers and Gyratories

The sole advantage of jaw crushers is in the large receiving opening in comparison with the size of the machine. To save sledging or reblasting of the quarry product, a large receiving opening is desirable; to get a 36-in. opening in a gyratory requires a machine having a capacity of 600 tons per hour; in jaw crushers a much smaller machine, one having a capacity of 160 tons per hour provides as large an opening. If the large capacity is required, the gyratory is the more economical; if the smaller capacity of the corresponding jaw crusher is sufficient, then it is the more econorical, since to operate a gyratory semi-idle is a greater waste of power than the lost motion in the jaw crusher, which is, of course, idle while the movable jaw is receding.

The ratio of reduction that can be efficiently accomplished is practically the same for jaws and gyratories; their limitation is in fine crushing. The very fact that the process in both these types depends on the crushing parts approaching each other to compress the stone and then receding to pass the material sufficiently reduced; the fact that the crushing parts must open up with a motion of an inch or more in small machines precludes the possibility of their being used to advantage in reducing material to 1 in. or even 1½ in. Recrushing rolls are not open to this objection.

Crushing Rolls

The discharge opening in rolls is fixed except as the springs permit its widening; they can, within limitations, reduce material to this size of opening. Of the different types of machines they are probably least understood and about them there is the greatest difference of opinion among crusher operators. Neither their possibilities nor their limitations seem to be well defined.

They are essentially recrushing machines, suitably only for reducing to 1-in. or 2-in., and the sizes from which they will reduce are definitely limited, depending upon the character of the stone and the diameter of rolls.

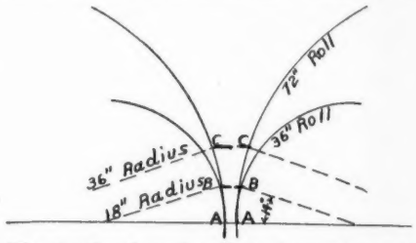


Fig. 2—Angles of radius of crushing rolls

How the diameter of the rolls prescribes the size of stone that can be fed is shown in Fig. 2, a diagramatic view of 36-in. and 72-in. rolls set to one inch. At the point of nearest approach the surfaces of the two rolls in each set are, of course, parallel; at increasing distances from this point the angle between the surfaces of the two members increases rapidly, more rapidly in the smaller members. The angle at which it has been found practicable to crush quarried stone in gyratory and jaw crushers is about 28 deg. Even at this angle boulders with smooth surfaces will be thrown up rather than be broken.

It can be taken for granted that this angle is the largest at which rolls will "nip" or pinch the stone fed to them—28 deg.—which means 14 deg. on each of the two members.

In Fig. 2 the distance **AA** is that between the rolls at point of closest approach. At **BB** where the surfaces form an angle of 28 deg. the distance between them is increased by twice the versine of a circle of 18-in. radius for 14 deg. The versine for 14 deg. is 0.0297; for the smaller circle it is 0.5346 in., so that the distance **BB** becomes 2.069 in. For the 72-in. rolls the distance **CC** is 3.138 in. If the rolls are set farther apart the added distance must be added to the above figures.

Fixes Size of Feed

For stone that can be "pinched" and broken at no greater angle than 28 deg.

these figures are accurate and there is no use trying to feed larger stone; they will ride on the revolving surfaces and act as a brake, wearing away the shell and consuming power. Where a stone is riding, of course no others can pass and when they come fast enough, there is a complete choke-up. It is as useless to throw 4-in. stone into 36-in. rolls as to throw 12-in. stone into a gyratory with a 10-in. opening.

It has been found that corrugations on the rolls increase the angle of "nip," that gritty stone will also be gripped at a greater angle, but for ordinary limestone and granite these figures define the limitations of rolls.

Considering Fig. 1 and the measure of work done by breakers, it will be thought that rolls do not do any great part of the work of reduction, and it is true that they are limited to fine crushing, but of this they will do a great amount, and there are few commercial plants in which the last reduction is not a large part of the problem. They are not dependent on gravity as are jaws and gyratories to remove the sizable stone, only on their own speed.

In records of production with recrushing rolls, one of the most characteristic installations is producing 4,000 tons of 2-in. stone in three machines, in ten hours, one mammoth gyratory and two sets of rolls 30 x 72 in. The initial breaker delivers stone to the rolls, each set reducing 200 tons per hour to 85 per cent 2-in. The speed of the rolls is 55 R.P.M. and the gyratory is rated to deliver 5 to 8-in. material.

In granite the size of feed is more strictly limited for rolls, but for fine crushing, they are more expedient than either gyratory or jaw crushers. Records are at hand only for reducing to ½-in. and finer; in this a set of 54 x 20 rolls, fed 2½-in. stone are reducing 80 tons per 10 hours to ½-in.; another set 14 x 20 receiving 1-in. stone are reducing 60 tons per day to ½-in.

(To Be Continued)

For Lower Prices Give Us Capacity Orders, Advises Crushed Stone Man

A. J. Sullivan, of Chicago, Warns Public Officials That Delay in Work Only Tends to Still Higher Prices—Governor Calls Meeting and State Decides to Spend $6,500,000 on Roads at Once

ILLINOIS STATE authorities hesitating in the resumption of public work, were told in letters by A. J. Sullivan, of the United States Crushed Stone Co., in the past few days that only immediate resumption of work could possibly bring about lower prices, because, in the crushed stone business especially, volume is needed to bring about a reduction of prices.

At a meeting called by the governor for Friday, February 21, to which the Illinois Manufacturers' Association had been invited, the authorities were also told that a rise was more imminent than a lowering of price in building materials.

Will Spend Money Now

The meeting resulted in the decision of the state to go ahead with a road building program for which it had on hand $6,300,000, part of which is federal aid. The department will proceed at once with its estimates. The $60,000,000 bond issue is held up because the supreme court has not passed on its constitutionality.

In reply to a letter of inquiry from Thomas G. Vennum, assistant director of the Department of Public Works, who asked when the producers were going to reduce prices, Mr. Sullivan said in effect:

"We are still paying war prices for virtually everything that we use in this business and we feel that the present price of crushed stone is lower than any other product. I would suggest that the state begin work soon so as to enable the producer of these commodities to begin operations as near capacity as possible, thereby reducing the cost of the commodity.

Profit Per Ton Small

"You can readily understand that the successful and economical operation of a crushed stone plant is based upon volume. The profit per ton is so exceedingly low that it requires a great volume of business to make any profit whatever, and if volume is curtailed it naturally increases the cost.

"Further, if we are to be handicapped by our inability to secure a large tonnage early in the season, it will necessarily run our costs up sky high, all of which must be taken into consideration in the sale of the material later in the season when the demand should be normal.

"To secure a reasonable price we would suggest that an early start on construction work be made."

A few days before this Mr. Sullivan had written a similar letter to Governor Lowden.

A Piece-Work Incident

A MAN OF LONG AND WIDE EXPERIENCE in the quarrying and crushing business in explaining why he preferred to put his labor on a piece work basis told of a specific incident illustrative of the advantages of this plan. With him he said it was not so much a matter of getting work done cheaper, but of stimulating effort and preventing growth of the loafing habit. He found that one or two loafers or slow pokes would demoralize a whole crew with the result that the work would lag and the output be lowered.

Then he told of one big husky man he had in his crew who was so slow and so uninviting generally that he couldn't get others to work with him. He had a plan of working the men in pairs loading his rock bars and it got so nobody liked to work with this man though he was big and husky and able to do more than most men if he would only do it.

Then he concluded to put them on a piece work basis, paying so much for each car of about two yards. The men readily paired off except this one big loafer, who couldn't get any one of the crew to go partners with him. Finally the big man went out in the neighborhood and got just a lad of a boy to work with him. And when he got to work on the piece plan he buckled to it so much better that he and the boy practically led the crew in quantity of stone handled.

The quarryman said that he found it essential for his men to make fair money and be satisfied, and he figured the piece work plan as a gain for the men rather than himself so far as the actual cost of production was concerned. But it had a good effect in preventing loafing and in assuring those fair weekly earnings which make men contented and enable them to live right.

Members of the Executive Committee of the National Association of Sand and Gravel Producers

Interesting Sketches of Men Prominent in the Industry, Their Activities and Accomplishments in Business and General Loyalty to the Organization—Registration at the Convention

Burton H. Atwood, president of Interstate Sand & Gravel Co., Chicago, re-elected member of Association Executive Committee

John Prince, head of Stewart Sand Co., Kansas City, Mo., beginning first term as member of Executive Committee

Burton H. Atwood

BURTON H. ATWOOD, president of the Interstate Sand and Gravel Co., Chicago, is one of those members of the Executive committee possessing originality and initiative. When there is work to do for the good of the industry and the association he is ready to shoulder the task. Thus he appears to be engaged almost constantly on some plan or idea that relates to association activities or the industry's welfare.

The program and the arrangements for the convention were due largely to him. His job was the management of the preparation work at least of the convention, for the secretary, E. Guy Sutton, of course, could not be on the ground to look after the matter.

Mr. Atwood was the author of five of the six resolutions adopted by the convention. That they went through virtually as submitted all testify to his forethought and grasp of the situation. This preparatory work helped to facilitate the convention business. He has served several terms as member of the committee and is also active in the Chicago Association.

Nearly a year ago, Mr. Atwood severed his connection with the Atwood-Davis Sand Co. to take the presidency of the Interstate, which he organized. This corporation bought the plant of the Lake County Gravel Co. at Libertyville, Ill., which is operated by electricity. Mr. Atwood is a member of the bar, having been granted a license to practice within the past year, but he will stick to the sand and gravel business, meanwhile utilizing his legal knowledge to the best advantage.

J. E. Carroll

J. E. CARROLL, president of the J. E. Carroll Sand Co. and of the Niagara Sand Corporation of Buffalo, N. Y., is one of the oldest producers in that territory and stands in the forefront of those taking a prominent part in activities for the good of the industry. He was one of the active members of the Executive committee of the National Association of Sand and Gravel Producers during the past year and like the other directors has attended meetings in different cities at his own expense

J. E. Carroll, president of J. E. Carroll Sand Co. and Niagara Sand Corporation, Buffalo, re-elected member of Executive Committee

Jno. S. Porter, manager of Huron Shore Gravel Co. and other gravel operations, Saginaw, Mich., beginning first term on the Committee

that the association might prosper through the solving of the many problems that hampered organization work, and the industry's development. He is now beginning his second year on this committee, having been re-elected following the adoption of the new constitution at the last convention.

The Niagara Sand Corporation is a dredging proposition and obtains its sand from Lake Erie. It ships from Buffalo. The J. E. Carroll Sand Co. digs its material from pits and has three shipping points, Attica, Gowanda and Buffalo, New York.

John Prince

JOHN PRINCE is a graduate in civil engineering of Cornell University. After several years' experience in the practice of civil engineering he broke into the crushed-stone business with a railway ballast order. About five years ago he merged his company with those of three or four other crushed-stone producers supplying the Kansas City market, forming the Prince-Johnson Limestone Co., of which he is the president.

His affiliation with the sand and gravel industry is more recent and came through his association with the Stewart-Peck Sand Co., now the Stewart Sand Co., of which Mr. Prince has recently become the active head. This is a dredging company with plants ashore.

Mr. Prince served as chairman of the 13th district of the committee on mineral aggregates and was very largely responsible for the splendid organization developed in that district. On January 15 last all the producers of this district met in Kansas City, Mo., at his invitation and there formed the Mid-West Association of Mineral Aggregate Producers, being the second association to be formed which includes both sand and crushed-stone operators.

Jno. S. Porter

JNO. S. PORTER, who has taken a leading part in fighting the railroad rate "revisions," is an old railroad man and is posted on railroad expense in the freight end of the business. Being also the head of three producing operations, the Huron Shore Gravel Co., and the Marquette Gravel Co., Saginaw, Mich., and the D. & M. railroad pit, he understands the viewpoint of both the railroad man and the mineral aggregate producer.

With respect to freight rates he knows that they ought to be high enough to keep railroads going—low enough to keep industries going and fair enough to keep good humor and good relations going.

Mr. Porter has been acting secretary of the Michigan Sand and Gravel Producers' Association since its organization. During the war he was associated with G. A. France of the France Stone Co., Toledo, Ohio, chairman of the 11th district of the War Service Committee on Mineral Aggregates, and took charge of Michigan interests for Mr. France. As member of the Executive committee, to which he has been elected by the national association, he will prove a valuable member.

Registration of Sand and Gravel Producers at Third Annual Convention of National Association, January 28-29, 1919

J. W. Alder, American Sand & Gravel Co., Chicago.
J. H. Allen, Lincoln Sand & Gravel Co., Lincoln, Neb.
Chas. J. E. Anderson, Craig Building Material Co., Chicago.
Burton H. Atwood, Interstate Sand & Gravel Co., Chicago.
Guy C. Baker, Greenville Gravel Co., Greenville, O.
H. F. Battjes, Battjes Fuel & Building Supply Co., Grand Rapids, Mich.
D. D. Battjes and Nicholas H. Battjes, Standard Builders Supply Co., Grand Rapids, Mich.
Frank L. Beck, Franklin L. Beck Co., Evanston, Ill.
Chas. P. Biesanz, Biesanz Stone Co., Winona, Minn.
Frank J. Billeter, Sec. Indiana Gravel Co., Indianapolis, Ind.
John N. Bos, John N. Bos Sand Co., Chicago.
E. W. Boynton and Geo. H. Boynton, Northern Gravel Co., Muscatine, Iowa.
J. C. Brandt, Lincoln Sand & Gravel Co., Lincoln, Ill.
Geo. G. Brew, Waukesha Stone, Sand & Gravel Co., Milwaukee, Wis.
W. Frank Bradley, Ohio-Michigan Sand & Gravel Co., Toledo, O.
J. C. Buckbee, Northern Gravel Co., Barton, Wis.
Reid C. Bye, Chas. Warner Co., Wilmington, Del.
W. P. Carmichael, Carmichael Co., Williamsport and St. Louis.
J. E. Carroll, Niagara Sand Corp., J. E. Carroll Sand Co., Buffalo, N. Y.
John P. Canttor, Neal Gravel Co., Mattoon, Ill.
J. M. Clicquennoi, Wisconsin Sand & Gravel Co., Milwaukee, Wis.
Chas. W. Clark, Standard Sand & Gravel Co., Clinton, Ind.
H. D. Conkey, H. D. Conkey & Co., Mendota, Ill.
F. D. Coppock, Greenville Gravel Co., Greenville, O.
J. P. Coyle, Consumers Co., Conway Bldg., Chicago.
A. J. Crawford, A. J. Crawford, Cambridge, Ill.
H. F. Curtis, Pres., Lyman-Rickey Sand Co., Omaha, Neb.
Alex. W. Dunn, Keystone Sand & Supply Co., Pittsburgh, Pa.
H. S. Davison, J. K. Davison & Bro., Pittsburgh, Pa.
Harry Donnelly, Ohio Ballast Co., Cincinnati, Ohio.
J. H. Duffy, Ohio River Sand Co., Louisville, Ky.
H. S. Earle, Genesee Gravel Co., Detroit, Mich.
D. J. Ellingen, H. D. Conkey & Co., Mendota, Ill.
H. L. Fishel, Barry Sand & Gravel Co., Lincoln, Ill.
R. C. Fletcher, Des Moines, Iowa.
J. A. Foley, Construction Materials Co., Chicago.
Wm. Frogner, Chicago Gravel Co., Chicago.
John P. Gallagher, H. D. Conkey & Co., Mendota, Ill.
Sam C. Gates, Kunzel Thompson Sand & Gravel Co., Knoxville, Tenn.
S. A. Gibson, Rockford Sand & Gravel Co., Rockford, Ill.
Hugh Haddow, Jr., Menantico Sand & Gravel Co., Millville, N. J.
F. E. Hall, T. J. Hall Co., Cincinnati, O.
R. E. Hammond and Geo. B. Hart, Chicago Gravel Co., Chicago
J. L. Hodgson, Tfr. Mgr., American Sand & Gravel Co., Chicago.
Howard B. Hoel, Greenville Gravel Co., Greenville, O.
E. Huwald, Western Sand & Gravel Co., Spring Valley, Ill.
Lt. C. Knoblauch, H. D. Conkey & Co., Mendota, Ill.
Louis L. Laun, Elkhart Sand & Gravel Co., Elkhart Lake, Wis.
Frank E. Lane, Janesville Sand & Gravel Co., Chicago.
Geo. P. Longwell, Consumers Co., Chicago.
S. R. MacNeal, Lincoln Sand & Gravel Co., Lincoln, Ill.
Milton McDermott, Knoxville Sand & Transportation Co., Knoxville, Tenn.
J. W. McGrath and T. E. McGrath, McGrath Sand & Gravel Co., Lincoln, Ill.
Joseph R. McGaw, Ohio River Sand Co., Pittsburgh, Pa.
H. L. McGurk, Interstate Sand & Gravel Co., Terre Haute, Ind.
John E. McNichols, Producers Material Co., Chicago.
E. L. Mack, A. Miller & Sons, Clinton, Ind.
J. Ross Mayer, Nickle Plate Gravel Co., Erie, Pa.
Geo. V. Miller and W. K. Miller, Granite Sand & Gravel Co., Indianapolis, Ind.
M. Miller, A. Miller & Sons, Clinton, Ind.
Geo. J. Nattkemper, Summit Sand & Gravel Co., Terre Haute, Ind.
H. E. Neal, Neal Gravel Co., Mattoon, Ill.
J. C. Oliver, Standard Sand & Gravel Co., Clinton, Ind.
Oliver Oswald, Burlington Sand & Gravel Co., Burlington, Ia.
James P. Pearson, Moline Consumers Co., Moline, Ill.
V. G. Pogue, Pres., Merom Gravel Co., Indianapolis, Ind.
J. S. Porter, Huron Shore Gravel Co., Saginaw, Mich.
John Prince, Stewart Sand Co., Kansas City, Mo.
Clifford V. Ray, Capital City Sand Co., Des Moines, Ia.
A. Y. Reed, A. Y. Reed Gravel Co., Chicago.
F. W. Renwick, Chicago Gravel Co., Chicago, Ill.
Edw. J. Roche, Reinert Bros., Chicago.
J. R. Sensibar, Construction Materials Co., Chicago.
G. A. Seivour, United Fuel & Supply Co., Detroit, Mich.
E. S. Shaneberger, Macksville Gravel Co., Terre Haute, Ind.
Jesse A. Shearer, Indiana Gravel Co., Indianapolis, Ind.
A. E. Sheltraw, Saginaw, Mich.
J. L. Shiely, J. L. Shiely Co., St. Paul, Minn.
E. T. Slider, Louisville, Ky.
W. O. Smith, Detroit Oxford Gravel & Stone Co., Oxford, Mich.
A. S. Sorensen, Atwood-Davis Sand Co., Chicago.
W. S. Smith, Memphis Stone & Gravel Co., Memphis, Tenn.
R. Snoddy, Coon River Sand Co., Des Moines, Ia.
F. A. Stephenson, Ideal Sand & Gravel Co., Mason City, Ia.
F. P. Steinberg, Carmichael Gravel Co., Williamsport, Ind.
P. A. Stewart, Kickapoo Sand & Gravel Co., Attica, Ind.
J. W. Stolzenbach, Iron City Sand Co., Pittsburgh, Pa.
E. Guy Sutton, Sec., National Association Sand & Gravel Producers, Indianapolis, Ind.
James H. Swango, Wabash Sand & Gravel Co., Terre Haute, Ind.
E. C. Theobald, Anderson Theobald Co., Vincennes, Ind.
C. E. Thomas, Ideal Sand & Gravel Co., Mason City, Ia.
R. E. Thomas, American Sand & Gravel Co., Chicago.
J. W. Webb, Northern Gravel Co., Muscatine, Ia.
G. P. Walker, The Tarco Construction Co., Cincinnati, O.
Lee R. Witty, Wabash Sand & Gravel Co., Terre Haute, Ind.
W. J. Woomer, Consumers Bldg., Chicago.
Earl H. Young, The Burlington Sand & Gravel Co., Burlington, Ia.
Paul L. Vittur, Secy. Silica Sand Assn. of Ill., Ottawa, Ill.

Gravel Pit With Dredge and Railway

Unusual Combination for Operating a Steam-Shovel Proposition Below the Water Line—Cincinnati Crushed Stone and Gravel Co.

HARRY DONNELLY, the well-known Cincinnati gravel man, operates three large plants. Two of these gravel deposits are adjacent to the Donnelly homestead, 20 miles northeast of Cincinnati, and material has been taken from them for many years. One of these, the Cincinnati Crushed Stone and Gravel Co. deposit, has yielded many hundreds of thousands of tons.

Originally it was an ideal steam-shovel operation with a railway out of the pit to the screening and washing plant on the edge of the pit above. Twenty to thirty feet of material over a large area was thus removed. This brought the excavating operation over a large part of the pit to within three or four feet of the water line. The Miami River borders the property and there is plenty of water in the gravel.

Dredge and Shovel Fill Same Cars

The deposit extends another twenty to thirty feet below the water line and to remove this gravel Mr. Donnelly has employed a dipper dredge. The unusual feature of this operation is that the dredge is used to load railway cars just as the steam shovel is used in another part of the pit. The same track level is used for taking out the material both above and below the water line.

The gravel is compacted well enough to carry the track alongside the dredge, as is shown in the accompanying illustrations. The track is laid parallel to the bank and about the width of the dredge scow from the water. The dredge then operates up or down the track removing its width of material as it goes. The dredge is held in place by spuds. Obviously the dredge is more easily moved than a shovel and more easily maintained.

The train of dump cars carries the material to a hopper which loads a belt conveyor to the top of the plant. The stripping runs from 3 to 5 ft. and is removed by a steam shovel and the same railway equipment used in the pit.

Incidentally quite a good sized pond is being formed which is well stocked with edible fish.

Harry Donnelly is associated with three brothers in the operation of the various plants. One brother is general superintendent of all the plants, and two are superintendents of individual plants. The superintendent of the Cincinnati Crushed Stone and Gravel Co. plant illustrated here, is Dan. D. Donnelly.

Harry Donnelly and his brother, Dan D. Donnelly

General view of Cincinnati Crushed Stone & Gravel Co. operation—Dredge operating on left, steam shovel on the right

Close-up of dredge and loading tracks

1—Revolving washing screen in new plant. 2—Conveying dried sand through tunnel to screening house at new plant. 3—Battery of tap screens

The Manufacture of Silica Sand in the Ottawa, Illinois, District

Part Two—Process Employed in Making High Grade Material for Foundry, Mill and Glass Factory—Plant Operations in Washing, Conveying, Drying and Grading Described

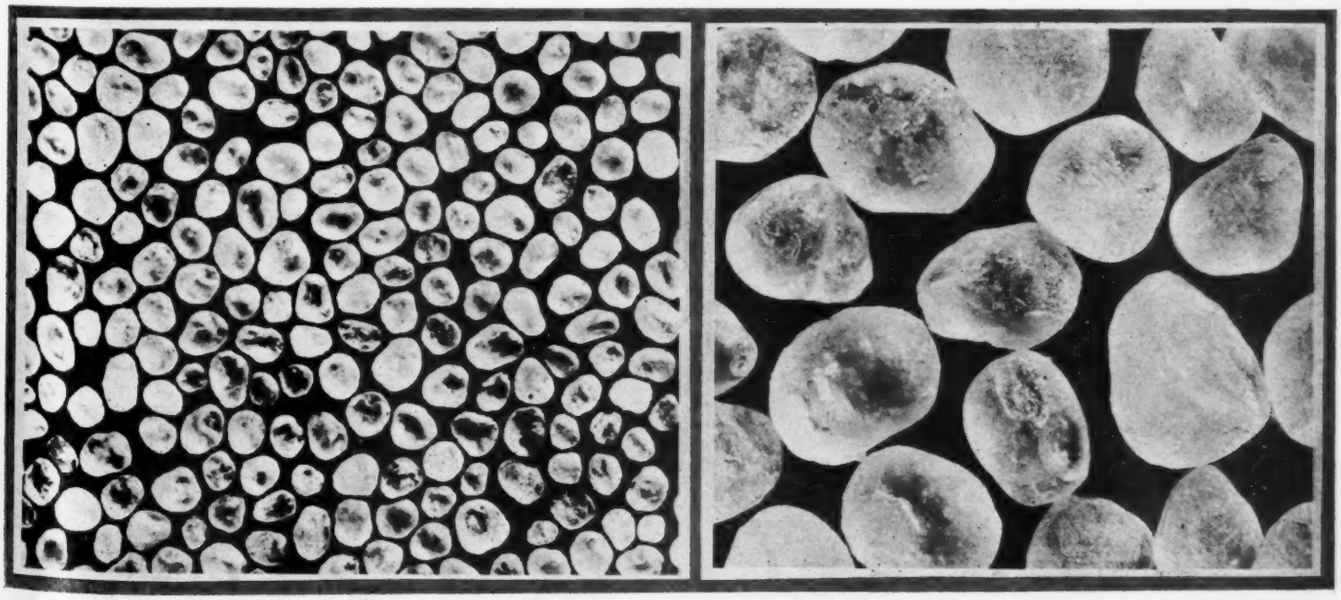
THE manufacture of high grade Ottawa (Illinois) silica sand for its various purposes in foundry and mill and glass factory is a process that employs facilities for washing, drying and screening or grading. In the modern plants of this district the processes are similar, although the machinery used does vary both as to kind and brand.

In the previous article, the quarry operations were described. In this the manufacturing end will be presented. As in the former article the United States Silica Company will be taken as typical and the differences between the two plants of this company where there are differences will be noted.

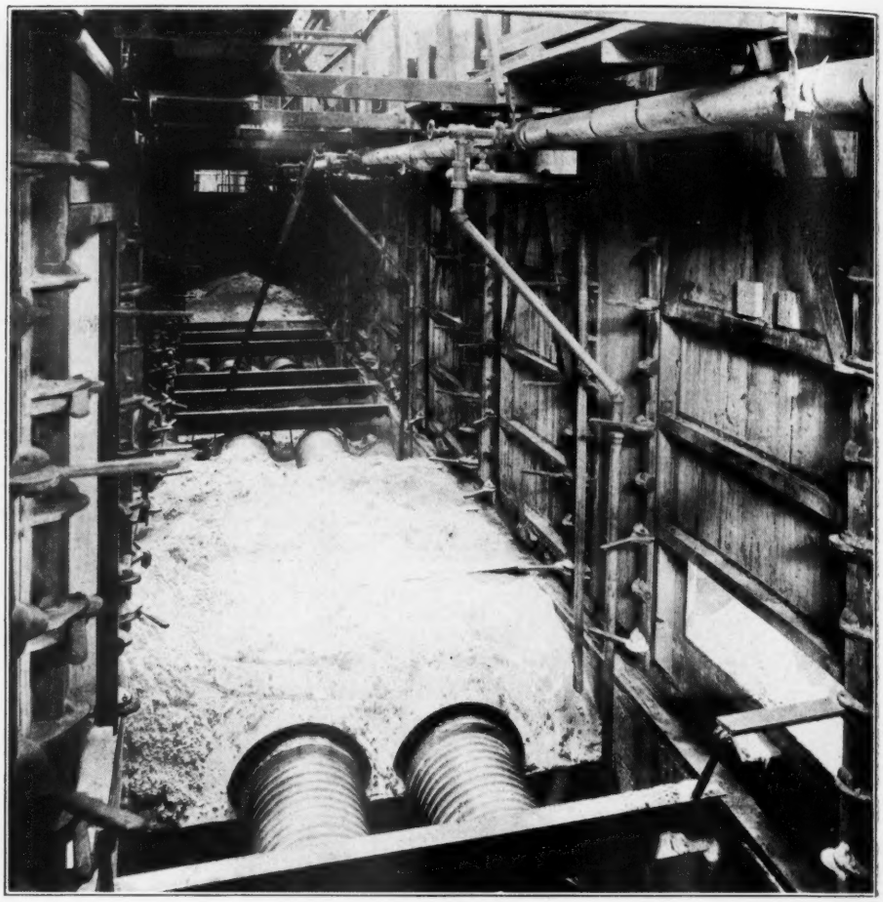
At the Miller (old) plant, the sand mixture from the quarry is received at the top of the washery in a box, 6 by 6 by 5 ft., from which a chute directs it into a cylindrical revolving six mesh wire cloth screen. The sand is passed while rejected stones and foreign material roll into a chute that leads to the dump outside.

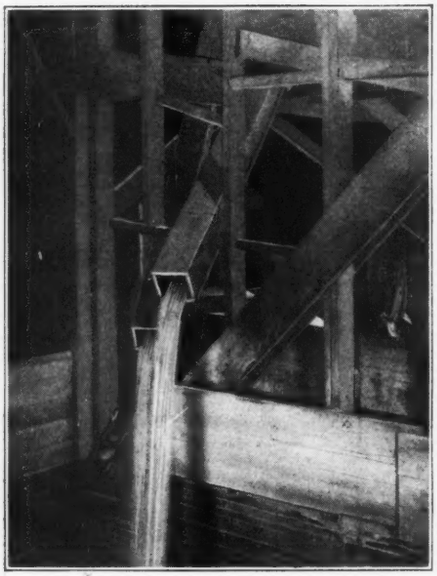
From the box in which the screen is set, an opening lets the material through into a "teeter-tawter" chute. That is, the chute can be tilted to the right or left into one or the other of two settling tanks below. While one tank is being filled up the other is being emptied. The settling tanks are also auxiliary washers. Two streams of clean water under 100 lbs. pressure are projected upward from the sides of each tank near the bottom to give the sand a final cleansing.

The settling tanks are emptied by a steam vacuum pump similar to that used in the pit, which propels the wet sand



Ottawa silica sand magnified; that at right greatly magnified. These photographs are used by the manufacturers of blasting sand to show absence of lines of cleavage—every grain a solid bullet





The man at the strategic corner above is the general superintendent of the U. S. Silica Co., Charles J. Luck, snapped on the job.

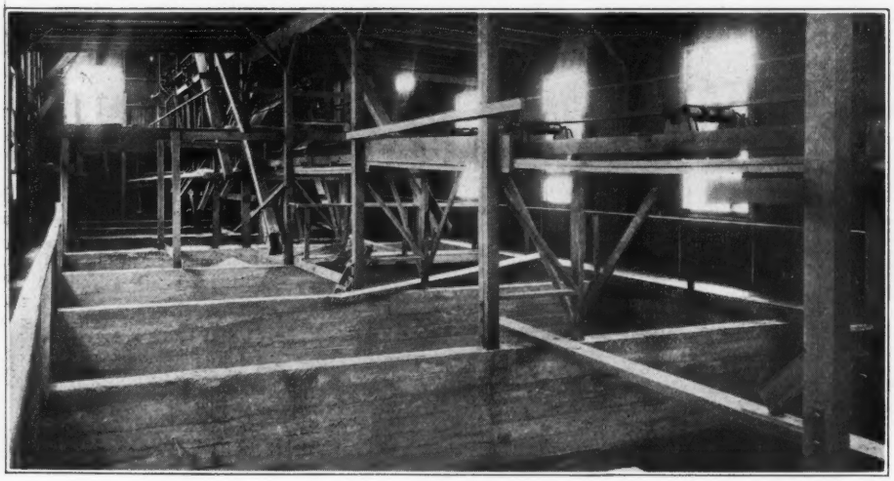
Above, drying compartment at the new plant. Large pipes carry waste heat (smoke); small steam pipes are below these. Notice gate of drain bin raised at right.

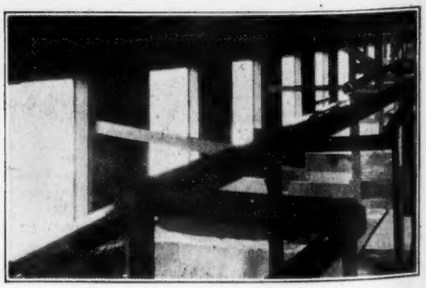
At extreme left, storage bins showing discharge from screens (old plant).

Central picture at left, dry bins at new plant storage house.

Lower left-hand corner, storage at new plant; screens in background.

Below, view of series of drain bins at new plant. Supply pipe extends along edges of windows.



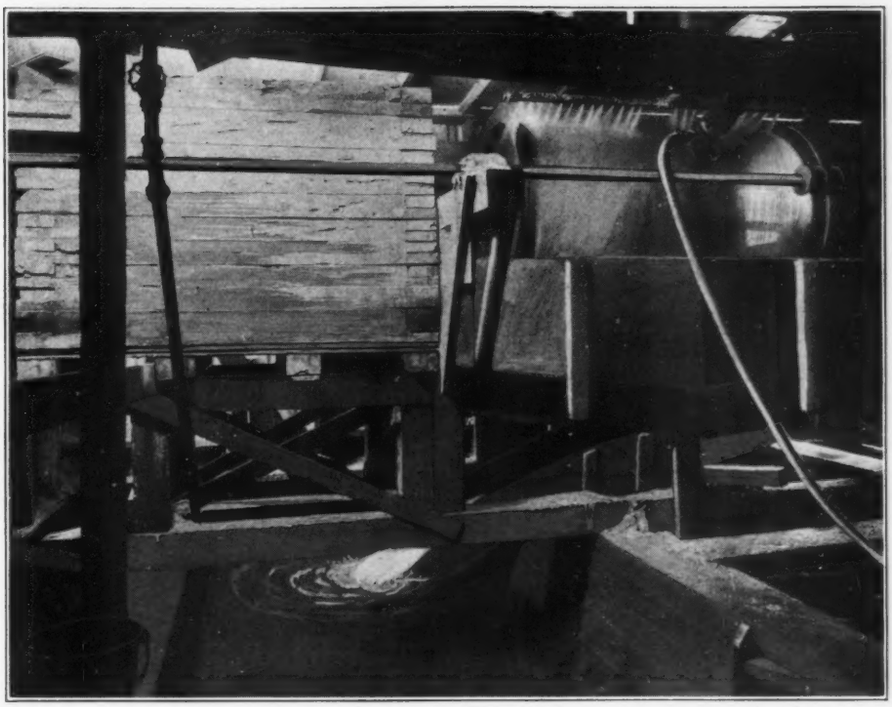


through a system of 5-in. pipes over the top of the drain bins (of wood at the Miller plant). There are two series of drain bins, one on each side of the drying compartment and above it. Each drain bin has a capacity of 30 tons. There are also four circular wooden tanks holding 66 tons each.

At one side of these bins are trap doors through which the drained sand is let onto 7 dryers, 16 ft. long and 6 ft. wide. At the bottom of the dryers are layers of steam pipes. The top layer of coils are 1½-in. pipes and 1½ in. apart. In each succeeding layer they are closer together and in the bottom layer ¼ in. apart. Three layers are of 1¼-in. pipe. The six layers fill a space of 3½ ft. in depth.

Carried to Screening House

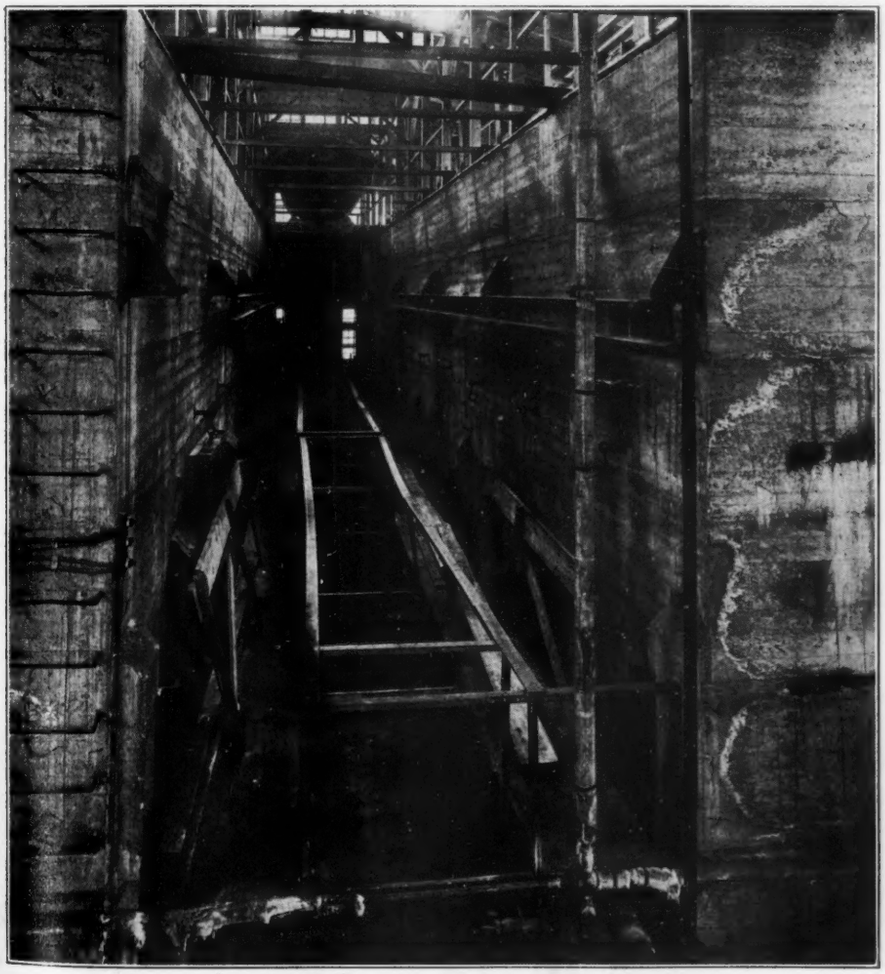
The dried sand falls onto a solid woven conveyor belt, 20 in. in width, on which it is carried to an elevator belt with 18-in. steel buckets which hoists the sand to the screening storage house. Here 12, 16 and 18-in. screw conveyors distribute the material to the screens. Openings in the jacket or enclosing box of the screw conveyors permit the steady flow of material onto each screen. There are two batteries of screens of the tap type, eight in each battery, one battery below the other.



Revolving washing screen at old plant. Settling tanks below; tank at right empty

The material is screened into four grades and these are deposited in wooden bins below, through chutes of which there is an intricate system including branches and switches. The bins are of concrete at the new plant.

It is interesting to note that the boxes enclosing the screw conveyors and the chutes are of pine without lining. Pine was finally selected to contend with the abrasive nature of the sand after experiments with all sorts of soft and hard woods. The experiments with pine show that wet sand is one-third as abrasive as dry sand, the pine under wet sand abrasion lasting three years and under dry sand only one year.



Drying chamber at new plant. Drain bins at each side

Car Loading by Gravity

For loading the graded sand is hoisted from an outlet at the bottom of each bin by a vertical bucket conveyor system to a hopper above car height, from which cars are loaded by gravity through spouts. Box cars are used in preference to the open kind in order that the consignment may be kept thoroughly dry, although experience has shown that a heavy rain will not penetrate a load of this sand more than a few inches in an open car. The rear ends of box cars are filled by hand shoveling. The loading capacity at the Miller plant is about 25 cars in a day of 10 hours, while 45 cars can be loaded at the new plant.

The Dickinson Plant

At the Dickinson plant the sand mixture from the quarry is received in a small hopper which releases the mixture directly into a cylindrical 6x6 mesh screen. As at the Miller plant the water sprays are directed from an exterior

point at the screen. Passed material enters one of two settling tanks as at the old plant. The dirty water and rejected material enters concrete gutters on the outside of the building and flows to the river.

Clean sand is raised by steam vacuum sand pumps and forced through 5-in. pipes to drain bins (concrete), which are arranged as at the Miller plant. A gate at the bottom of each bin, when raised, releases drained sand into the drying chamber which is equipped with the usual steam pipes and in addition waste heat (smoke) pipes, diameter 18 in. The waste heat pipes are above the coils of steam pipes.

The dried sand falls on a moving 16-in. belt. This conveys the material through a tunnel under the railroad tracks to the screening and storage house.

The conveyor discharges into the cellar of the storage house where an elevator with 18-in. buckets lifts the material to the top of the structure. Screw conveyor distribution, screening by tap screens and chuting of graded material are done as at the Miller plant.

The Dickinson plant is operated by electricity generated in the engine house. Exception is made of the two huge fans which control the movement of waste heat. These are cycloidal multivane fans, an overhung pulley type, with automatic chain oiling reservoir journal bearings and direct connections to a 5x7½ vertical steam engine. These fans operate at a speed of 280 r. p. m. and can handle gases at a temperature of 300 degrees F.

The company produces the following grades:

Crystal silica, for glass making.

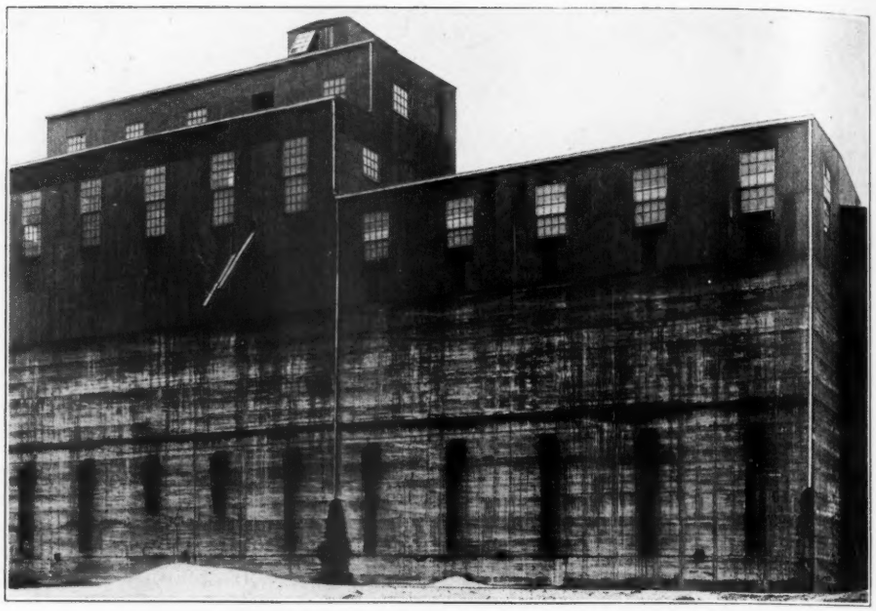
Flint silica, for molding steel and semi-steel castings, and for foundry cores.

50 mesh sand, for roofing, etc.

Flint shot, for sand blasting.

The company asserts that 97 per cent of the average shipment of Flint Shot will rest on a 40-mesh screen, and guarantees 95 per cent, and that all will pass through a 20-mesh screen. Other grades are screened as trade requirements call for.

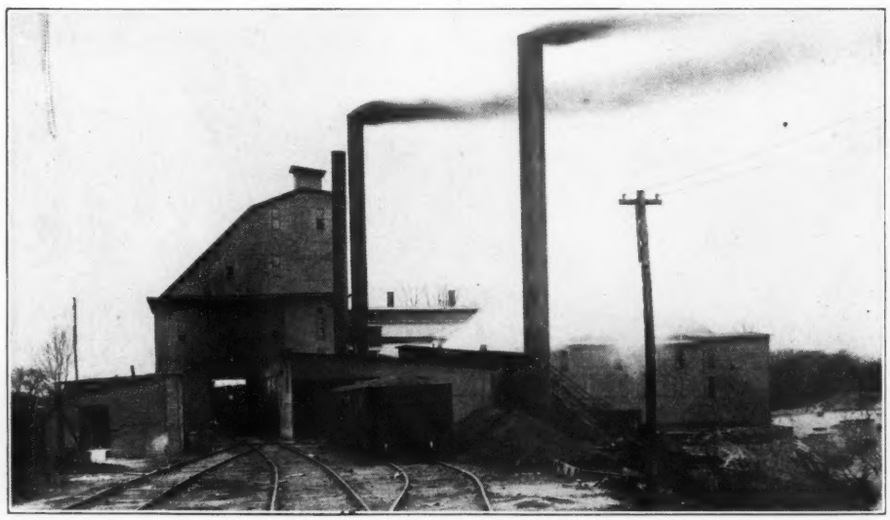
The United States Silica Co. has its main office in the People's Gas Building, Chicago. Volney Foster is president of the company; Lewis B. Reed, vice-president; H. F. Goebig, secretary. Charles J. Luck is general superintendent.



Dickinson (new) plant. Screening, grading and storage house

Silica Sand Association Proving Its Value

PAUL L. VITTUR, who was recently installed as the executive secretary of The Silica Sand Association of Illinois with headquarters at Ottawa, announces that the association is actively under way and its beneficial influence is felt by both producers and consumers.



Miller (old) plant. Power house in foreground; at left, grading and storage house; at right, washery and drain bin house

Sutton Fights for Lower Freight Rates in Washington, D. C.

WASHINGTON, D. C.—E. Guy Sutton, of Indianapolis, Ind., secretary of the National Association of Sand and Gravel Producers, and Geo. J. Nattkemper, of Terre Haute, Ind., have been in Washington for several days endeavoring to get the Railroad Administration to reduce freight rates on sand, gravel, crushed stone and slag. This action, they assert, will be beneficial to the building industry throughout the country and immediately will assist in the acceleration of building and construction activities so much desired by the Department of Labor.

They presented such telling arguments that the Division of Public Works and Construction Development have issued a long statement employing these arguments. As a result of their work, there appears to be some authority for believing that rates will positively not be raised this year, while the matter of decreasing rates is still in doubt pending a decision from the rate-making department.

Illinois Gravel Producers Engage Ben Stone as Director

PEORIA.—The Illinois Sand and Gravel Producers' Association held a meeting here February 18, with 92 per cent of the membership in attendance.

Ben Stone, of Springfield, was employed as business director of the association and will enter upon his duties March 15, with offices in the Illinois National Bank Building, Springfield, Ill.

Mr. Stone is a traffic man, having had 19 years of service with the Illinois Central Railroad.

The Use of Lime in Water Purification

Water Purification and Water Softening—Application of Lime—Determination of Water Soluble Calcium Oxide—High Calcium Lime Necessary

By Charles P. Hoover
Chemist in Charge, Water Softening & Purification Works, Columbus, Ohio.

IN WATER PURIFICATION LIME is used for two purposes:

1. To soften water.
2. To precipitate other chemicals used as coagulants, namely, sulphate of iron and sulphate of alumina. Lime must be used with sulphate of iron, but is rarely used with sulphate of alumina. It is used with sulphate of alumina only when the water, under treatment, is deficient in natural alkalinity, and for this reason a great many water purification plant operators prefer to use sulphate of alumina in preference to sulphate of iron for coagulative purposes.

Lime furnishes the hydroxyl ions (OH) necessary to convert soluble sulphate of iron into insoluble hydroxide of iron, as shown by the following reaction.

$$FeSO_4 + Ca(OH)_2 = Fe(OH)_2 + Ca\,SO_4$$

Sulphate of Iron, Lime, Hydroxide of Iron, Calcium Sulphate

When lime and sulphate of iron are added to water, in proportion of one pound of lime and one pound of iron to 7000 gallons of water, the combination formed by the union of the lime and iron is a flocculant gelatinous coagulative material which settles quickly, dragging down any suspended matter or mud present in the water under treatment. The action and result is similar to the action and result obtained by coagulating coffee with egg. In the treatment of coffee the egg is coagulated by heat, whereas in the treatment of water the iron is coagulated by lime; the resultant product in each case, however, accomplishes the same result; clarification.

In the State of Ohio the following cities use lime to coagulate sulphate of iron or for softening purposes in connection with the purification of their public water supply.

Softening Water With Lime

In order to remove the temporary hardness of the water to the lowest possible figure lime should be added, in quantities just sufficient to absorb the free and half bound carbon dioxide and to precipitate the magnesium. If more lime is added than is necessary to absorb the carbon dioxide and to combine with the magnesium, then the water will be overtreated with lime, and, this is objectionable because the excess of lime will cause the water to have a disagreeable taste, and, whereas, the right quantity of lime softens water, after that quantity has been added, any additional amount or excess is just hardness put back into the water.

Advantages of Softening

The advantages of softening a hard municipal water supply are many, the most important being:

1. Intestinal and pathogenic bacteria are killed, rendering the water safe bacterially.
2. The water is clarified.
3. Color is removed.
4. Lime softened water is not corrosive to iron pipes, thus no trouble is experienced from the accumulation of "red water" in dead ends of the distribution system.
5. The sterilizing action of the lime persists indefinitely.
6. Saving of soap to the water consumer. Prof. C. W. Foulk of the Department of Chemistry at the Ohio State University has estimated that the softened water supply of Columbus, O., saves the consumers $200,000 per year in the use of soap.
7. Saving of coal, and wear and tear on boilers.

Municipal plants in Ohio using lime for softening water are: Cleveland, Columbus, Oberlin, Medina. Almost all the railroads operating in the northern and central part of the State of Ohio and in many other parts of the United States use lime to soften the water which they use for boiler feed purposes.

There are also numerous small water softening plants in this country using lime, located principally at laundries and at industrial plants where large quantities of water are used for boiler feed purposes.

Methods of Applying Lime to Water

The following methods of applying lime to water have received considerable attention:

1. Treating the water with a saturated solution of lime water (60 grains CaO per gallon).
2. A continuous feed of a standard strength solution of milk of lime.
3. Feeding the dry lime into the water by means of a screw conveyor device, the speed of which is regulated so as to feed a constant quantity.
4. Adding weighed amounts of lime at definite intervals of time.

Saturated Lime Water

Applying lime as a saturated solution is a complicated procedure, and has been shown to be impracticable on a large scale.

The reasons for favoring this method in former years were:

1. Lime water being a true solution could be more readily applied in uniform quantities than milk of lime.
2. The feasibility of thoroughly mixing raw water with milk of lime in large quantities was questioned. It was thought that the raw water and the milk of lime would not be adequately mixed, resulting in the marked loss in softening efficiency, owing to the fact that the suspended particles of lime (calcium oxide) would become coated with precipitated carbonate of calcium and magnesium hydrate, thereby becoming inactive.

Standard Solution of Milk of Lime

The lime is slaked in slaking tanks and discharged into solution tanks below. Milk of lime of required strength (1 to 4% solution) is made up by the addition of water. It is necessary to keep the milk of lime well stirred or agitated, so that the strength of the solution will not vary at different depths. Unless the milk of lime is well agitated much of the lime will settle, thus causing the solution to be thicker and stronger at the bottom than at the top of tank, and consequently the first foot or two used from the tank will result in overtreatment of the water, and the use of the rest of the tank will result in undertreatment.

Ohio Cities Which Use Lime

APPROXIMATE QUANTITIES OF LIME USED EACH MONTH AT OHIO WATER PURIFICATION PLANTS IN 1918.

City	Etimated 1918 Population	Kind of Lime	No. of Months Averaged	Lbs. Lime Used Monthly
Bellaire	15,300	Hydrated	10	33,600
Cambridge ..	13,700	Hydrated	..	*13,300
Cincinnati ...	425,300	Quick	10	182,000
Cleveland	784,000	Quick	7	200,000
Columbus	247,000	Quick	10	713,000
Dennison	9,400	Hydrated	..	*12,800
East Liverpool	25,300	Hydrated	..	*30,000
Elyria	22,000	Hydrated	10	10,500
Marietta	13,800	Hydrated	10	14,500
Medina	3,100	Hydrated	10	5,300
Napoleon	4,400	Hydrated	10	5,500
Niles	11,300	Hydrated	10	27,800
Oberlin	4,400	Hydrated	..	*6,500
Port Clinton..	3,500	Hydrated	9	1,900
Portsmouth ..	31,000	Hydrated	10	24,600
Steubenville .	31,400	Hydrated	10	26,100
Toledo	222,400	Hydrated	4	310,100
Wellington ..	2,200	Hydrated	10	2,100
Woodsfield ...	3,000	Hydrated	5	1,400
Youngstown .	117,000	Hydrated	5	170,000
Totals (20)..	1,989,500			1,791,000

*Estimated.
Notes: (1) All above 20 plants now using lime.
(2) Data compiled by F. H. Waring, State Department of Health.

Agitation is necessary with solutions of hydrated lime as well as with solutions of slaked quick lime.

At the Columbus, Ohio, plant paddles were installed for stirring the lime solution, but these proved to be inadequate, and jets of compressed air have been supplemented at three points near the bottom of each solution tank.

Tests made upon portions at 15-minute intervals, from the time the solution tank first begins to discharge until it is empty, show that the solution varies in strength from about 2 or 3% each side of the mean.

The milk of lime, prepared and agitated as described above, is measured through an orifice into the water. In large plants where large volumes of the solution are used this can be done successfully, but it is difficult to apply milk of lime in this way at small plants where it is necessary to feed the solution through a small orifice. Small pipes and small orifices are more apt to "lime up" and be "plugged up" with milk of lime than large pipes and large orifices. The difficulty of applying lime at small plants has resulted in the development of the dry feeding device already referred to

Adding Weighed Amounts of Lime

The method of adding weighed amounts of lime at definite intervals of time is used at the St. Louis Water Purification Works and at Cleveland, O. In this method of procedure, crushed lime is elevated to storage bins, dropped into automatic weighing scales and definite weighed amounts are discharged from the scales into slaking tanks at predetermined intervals.

Purchase of Lime for Water Purification

The value of lime for water purification depends upon its percentage of water soluble calcium oxide. The percentage of inert material, such as carbonate of lime, cinders, unburned or overburned lime, magnesium, alumina and silica increase or decrease in the same proportion as the calcium oxide content increases or decreases, and the presence of this inert material detracts from the value of the lime because it increases the bulk, thus increasing the cost of handling and storing it. This inert material, being insoluble in water, causes trouble by clogging the slaking tanks and orifice boxes and necessitates more frequent cleaning of the sedimentation basins.

In paying for lime the contractor should be paid a real bonus when the calcium oxide content of the lime exceeds the guarantee and a real penalty should be exacted when the percentage of calcium oxide is below the guarantee. The following example will explain what is meant by a real bonus and a real penalty:

If lime containing 88% calcium oxide is worth $5.28 per ton, then lime containing 100% CaO would be actually worth (if the value is based on the calcium oxide content alone) $6 per ton, or, each one per cent, by which the lime is above or below the guaranteed amount of calcium oxide, would represent a value of 6 cents per ton. If, then, the contractor agrees to furnish 88% lime for $5.28 per ton and is paid 6 cents per ton for each one per cent departure from the guarantee, he receives no real bonus or penalty.

Several years ago it was customary at our plant to pay a stipulated bonus for each one per cent departure from the guarantee; for example, during the year 1912, it was agreed to pay the contractor $5.27 a ton for lime, for any carload lot containing 88% of water soluble calcium oxide, and to pay a bonus or exact a penalty of 7 cents per ton for each one per cent by which the water soluble calcium oxide in any carload lot delivered exceeded or was less than 88%. In the above agreement, actual bonus was paid or a penalty exacted of approximately one cent per ton for each one per cent by which the water soluble calcium oxide departed from the guarantee.

W. F. Montfort,* in an article on the purchase of lime for water purification, recommends that a bonus or penalty clause (introduced to guard against loss incident to impurities) shall be in terms of percentage of the contract price. This form of contract, he points out, is better than a contract that gives a bonus and penalty of so many cents per ton for each one per cent departure from the guarantee, as the contract price is a variable quantity and whether or not a real or actual bonus or penalty is in effect depends on the contract price.

The contract for lime at the Columbus plant was changed in 1913 to read as follows:

> For any carload of lime containing 88% of water soluble calcium oxide the City will pay to the Contractor the price per ton stated in the proposal. It is hereby agreed that the City shall pay a bonus of 1½% of the contract price per ton for each one per cent by which the water soluble calcium oxide in any carload lot delivered shall exceed 88%, and shall exact a penalty of 1½% of the contract price per ton for each one per cent by which the water soluble calcium oxide in any carload lot delivered shall be less than 88%.

The contract price for lime at the Columbus plant has varied from $5.17 to $11.05 per ton. The Columbus plant is a municipally operated plant, and all contracts must be awarded by competitive bidding, therefore it is not known what the price will be until after the bids are opened, consequently, not knowing what the price is to be, and having to consider also variations in price, it is evident that a just bonus or penalty clause in terms of a stipulated amount cannot be determined, therefore it is better to follow Mr. Montfort's method of stating the bonus and penalty clause in terms of percentage of the contract price.

*Paper read before the Public Health Association, Washington, D. C. (Eng. News, Nov. 14, 1912.)

Analysis of Lime

Determination of CaO (Sugar Test): Dissolve 0.5 gram of finely pulverized lime in 100 cc. of a 10% sugar solution.

Shake one hour on shaking machine.

Filter through dry filter.

Titrate 25 cc. with N/10 H_2SO_4, using Phenolphthalein as indicator, the burette reading multiplied by 2.244 = % CaO.

(The 10% sugar solution should be made with cool, freshly boiled distilled water.)

Determination of CaO (Ellms Method)

1. Take ½ gram sample.
2. Shake with little cold water in 500 cc. graduated flask.
3. Make up to 500 cc. mark with boiling distilled water.
4. Cool.
5. Make up to 500 cc. mark.
6. Shake 30 minutes.
7. Let stand 24 hours.
8. Titrate 50 cc. N/10 H_2SO_4 with Phenolphthalein and finish with methyl orange. Subtract the difference of the two titrations from the first or Phenolphthalein titration and the result multiplied by 5.61 = % CaO.

Producing Lime for Water Purification

A great many non-technical people think that if they have a limestone analyzing 90% calcium carbonate that a lime containing 90% calcium oxide can be produced. This is not the case, as will be shown in the following paragraph.

One hundred pounds of pure 100% calcium carbonate limestone will produce theoretically only 56 lbs. of lime; 44 lbs. of carbon dioxide gas is released and lost in burning; 100 lbs. of limestone containing 90% calcium carbonate and 10% inert material, such as silica, iron and alumina will produce 60.4 lbs. of lime, because in 100 lbs. of the stone there are 90 lbs. calcium carbonate which will produce 50.4 lbs. of calcium oxide or real lime (39.6 lbs. carbon dioxide) and 10 lbs. of inert material which is not changed or altered by the burning process, therefore adding it to 50.4 the result is 60.4. In the 60.4 lbs. of finished product there is contained 10 lbs. of inert material, or this is equivalent to 16.56%. Therefore, theoretically, an 83.44% calcium oxide lime is the best that can possibly be produced from a limestone showing 90% calcium carbonate and 10% inert material.

To produce high calcium lime for water purification purposes a very pure limestone must be burned. In practical operation, using the very best of stone available, it is very seldom that the lime produced will show over 91 or 92% water soluble calcium oxide.

Hydrated Versus Quick Lime

For railroad, industrial and small city water purification plants, where small quantities of lime are used, and where the lime must be stored for long periods of time, hydrated lime is to be recommended in preference to quick lime, because it does not air slack and can be kept indefinitely without losing strength.

Good hydrated lime should analyze 65% to 68% water soluble calcium oxide. For large water purification plants provided with storage bins, automatic weighing devices, etc., it is more convenient and cheaper to use quick lime.

A Critical Time for the American Potash Industry

Market for Material Vanishes Suddenly Despite Fact That Importation Will Not Be Available for More Than a Year—No Satisfactory Explanation, Says Geological Survey

THE PRESENT IS A CRITICAL TIME for the potash industry recently established in the United States, according to H. S. Gale, of the U. S. Geological Survey, Department of the Interior. Prior to the war this country used more than a million tons (gross weight) of potash salts each year, and it has been supposed that the cutting off of a large part of this supply was a keen deprivation, particularly to the farmer, by whom it was used for fertilizer. This foreign supply has not been available during the war, and with much energy and enthusiasm a domestic production equivalent to about one-fourth the former importation has been built up. Now, however, it is unexpectedly disclosed that there is little or no market for potash either at the high prices that have prevailed or even at a considerably lower price. No satisfactory explanation of this situation seems to be offered.

About 100,000 Tons in Storage

Approximately 100,000 tons (gross weight) of potash salts, produced in Nebraska in 1918, are reported as lying in storage warehouses, distributed throughout the southeastern States, which is the region where potash is principally consumed. This is of the same quality that was used in 1917 and is immediately available to the fertilizer manufacturer or the farmer. Potash of other sorts from various sources is also reported unsold, though in smaller quantities. As this surplus represents approximately half the relatively small domestic production and as potash from foreign sources has not been available during the year, it is difficult to explain this apparent lack of interest in the present small domestic supply.

There is a good deal of discussion about present sources and production of potash and apparently some confusion in the use of the terms by which this production is expressed. The following is therefore a brief summary of the situation based on the latest available data. The statistics for the year 1918 are not yet complete.

Imports Have Been Decreasing

Potash is a term commonly used in referring to the miscellaneous materials carrying potassium which are used or valued chiefly for the potassium contained in them. In 1913, the last year before the war, there was imported into the United States 1,092,588 short tons (gross weight) of the miscellaneous potash-bearing materials, equivalent to 270,720 short tons of "pure" or "actual" potash. This includes the figures for the following salts: Kainite, manure salts, chloride (muriate, sulphate, bicarbonate, bitartrate (argol), bitartrate (cream of tartar), carbonate (crude, crude black salts, and refined), caustic, chlorate, chromate, bichromate, ferrocyanide (yellow prussiate), ferricyanide (red prussiate), iodide, nitrate (saltpeter, crude and refined), permanganate, and Rochelle salts.

Since 1913 the imports of these substances have greatly decreased, until during 1916 and 1917 the total gross weight of potash salts imported was only about 25,000 short tons, containing about 8,000 tons of "actual" potash. By far the greater part of the potash formerly imported came from Germany, but some of the substances named in the list have come from other places and were received even during the war.

Future of Cement Mill Potash

The potash recovered as a by-product from the dusts of cement and blast furnaces bears great promise for future production that may be maintained in the face of competition. It appears that a quantity of potash equivalent to nearly one-third of our normal annual requirements is now going to waste in cement-furnace dusts. The quantity lost in blast furnaces seems even greater, but we are probably not yet in a position to say what part of this is practically recoverable. The cement dust collected in the first 6 months of 1918 amounted to 5,909 tons carrying 658 tons of "actual" potash, which was less than 3 per cent of the total domestic production. The recovery from cement dust increased during the later part of 1918. Blast-furnace dust amounting to 792 tons, equivalent to 79 tons of "actual" potash, was recovered in the same period.

Vast Reserves Depend on Processes

Among the potential resources in process of development are the potash-bearing silicates, particularly the leucite rock of Wyoming, the greensands of New Jersey and elsewhere, and the potash-rich slates of Georgia, such as are found also in other parts of the country. There are vast reserves of these raw materials in this country, the utilization of which depends on the discovery or operation of processes cheap enough to permit production under normal competition with potash derived from other and from foreign sources. Many of these projects are of great merit and deserve encouragement. Even if no substantial assistance in carrying out the experimental work is offered to them, at least it is to the interest of the American public that they shall be allowed a fair chance to establish themselves.

No Foreign Potash for Us Next Season

Foreign potash cannot be delivered in time to be used for the next season's crops, so that if the present stocks of domestic potash are not sold very soon, fertilizers for the spring season will again be made in a form deficient in this essential constituent. This is not only unfortunate to the farmer, but may soon be ruinous to the newly established potash industry in this country. The stock in storage represents a capital investment of many million dollars, doubtless incumbered with obligations that must soon be met. The need for reaching some immediate understanding and action is therefore imperative.

Effect of Size of Sand Upon Strength and Absorption of Sand-Lime Brick

The Best Proportions of Sand to Use for the Best Results

By F. A. Kirkpatrick and F. W. Lapham*

U. S. Bureau of Standards, Washington, D. C.

THE RESULTS HERE GIVEN are a part of the investigation begun by Emley and Freed, previously reported in the Proceedings of this Association† for 1917 and 1918 under the title "Effect of Various Factors on the Properties of Sand-Lime Brick." The methods and apparatus were described in the above articles.

For the particular purpose of determining the effect of size of sand upon strength and absorption of sand-lime brick the following procedure was adopted. Standard 20-30-mesh Ottawa sand was ground in ball mills several hours. It was then screened by means of Tyler standard testing sieves of the following description.

Mesh of Sieve	Size of Opening Inches
20	.033
30	.0198
40	.0150
60	.0087
80	.0069
100	.0055
150	.0041
200	.0029

† The Sand-Lime-Brick Association—This paper was read by Warren E. Emley at the annual convention January 29 and 30, 1918.

The sand was separated into three portions as follows.

1. Passing 20-mesh, retained on 40-mesh.
2. Passing 40-mesh, retained on 100-mesh.
3. Passing 100-mesh.

These portions had the following compositions.

Mesh Range		Per cent
No. 1	(20-30	60.5
	(30-40	39.5
	(40-60	61.1
No. 2	(60-80	18.8
	(80-100	20.1
	(100-150	24.6
No. 3	(150-200	7.7
	(Thru. 200	67.7

These three sizes of sand were remixed in various proportions as indicated in Table 1. Each of these new mixtures formed 90 per cent by weight of the sand-lime brick specimens, the remaining 10 per cent being a high calcium hydrated lime, 95 per cent of which passed a 200-mesh sieve.

The sand and lime were thoroughly mixed dry, water added, and cylinder specimens 3 in. high and 1.596 in. in diameter molded under a pressure of 5000 lbs. per square inch. These were steamed 4 hours under 150 lbs. steam pressure (gauge reading), and after one week drying were broken to determine compressive strength. The broken pieces were used for the determination of absorption by immersion in water 24 hours.

The results are given in Table 1 and shown diagramatically in Figs. 1 and 2. The triaxial method of representation is employed in Fig. 1. This is necessary on account of the use of three arbitrarily chosen sizes of sands. Each side of the triangle represents mixtures of two sizes of sand and all points within the triangle represent mixtures of three sizes. The proportions are in percentage weights. The figures in small circles are the designating numbers of the mixtures from which the composition may be found by reference to the corresponding number in Table 1.

The composition may also be found directly from the diagram (Fig. 1) by tracing lines along the rows of circle inclosed figures to the sides of the triangle. For example take mixture No. 33. It is desired to find the proportion of 20-40 mesh sand in this mixture. The upper corner of the triangle (Mixture No. 1) is called the 20-40 apex representing a specimen containing 100 per cent of that size. The opposite side of the triangle (56-66) represents mixtures containing zero 20-40 mesh sand. Starting with mixture No. 33 a line parallel to the side 56-66 is traced through points 34 and 35 to point 36 which is designated as containing 30 per cent of 20-mesh sand. In like manner the amounts of 40-100 and 100-Dust sand in mixture 33 are found to be 40 and 30 per cent respectively.

The curved lines in Fig. 1 are drawn through points of equal compressive

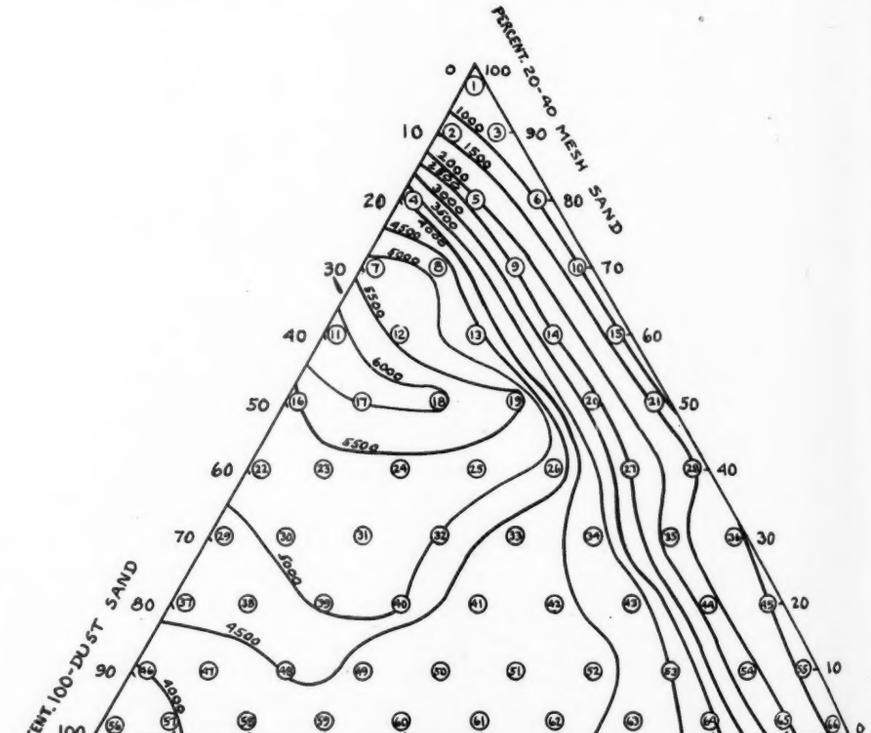


FIG. 1 COMPRESSIVE STRENGTH POUNDS PER SQUARE INCH

*By permission of the Director of the U. S. Bureau of Standards.

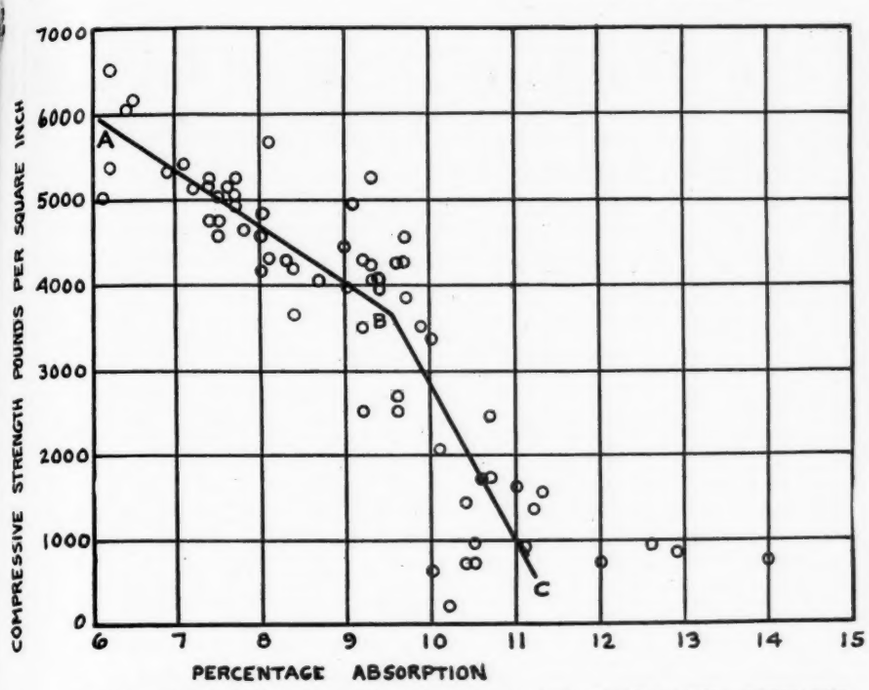


FIG. 2 RELATION BETWEEN ABSORPTION AND COMPRESSIVE STRENGTH

strength. These curves resemble contour lines and the distance between successive contours indicates the rate of rise of strength. It is noted that the increase in strength is rapid along the right side of the triangle in the area bounded by mixtures 1, 4, 64, 66, 1. This means that addition of up to 20 per cent of very fine sand to the coarser sand causes a rapid increase in strength, while further additions do not cause proportionally greater increases.

About 75 per cent of the commercial brick made in this country are produced from sand having the mechanical compositions represented within the area bounded by bodies 1, 4, 64, 66, 1 in Fig. 1. The remainder have considerable amounts of sand coarser than 20-mesh. The strongest brick was obtained by use of sand composed of 60 per cent 20-40 mesh size and 40 per cent of 100-Dust size (mixture No. 11.). This had a compressive strength of 6540 pounds per square inch. If larger specimens, say standard half brick, had been used, the strength per unit area would have been larger due to the effect of the size of the specimen.

In Fig. 2 is shown the relation between absorption and compressive strength. High strength corresponds to low absorption but the relation is not very exact, the plotted points not lying uniformly near the curve. Apparently other factors than absorption govern in part the compressive strength. The rate of increase of strength is greater for mixtures represented along the lower part of the curve (*B C*) than for those along the upper part (*A B*). This corresponds to the rapid increase in strength shown near the 20-40; 40-100 side of the triangle in Fig. 1, and the lower rate of increase for the remainder of the triangle. The points below the 1000 pounds line in Fig. 2 all represent mixtures of only two sizes of sand, 20-40 mesh and 40-100 mesh and their strength is very apparently not governed by the absorption.

In conclusion it may be said that the addition of sand finer than 100-mesh in amounts up to 20 per cent by weight caused increases in the strength of the brick up to as much as 400 and 500 per cent. Further additions of fine sand did not give much greater increases in strength.

TABLE NO. 1

No.	Composition of Sand Portion of Specimens By Weight 20-40 Mesh	40-100 Mesh	Through 100-mesh	Percentage Absorption	Compressive Strength Pounds per Sq. In.
1	100	0	0	10.2	215
2	90	0	10	10.4	1425
3	90	10	0	10.0	565
4	80	0	20	8.0	4155
5	80	10	10	10.1	2025
6	80	20	0	10.4	710
7	70	0	30	7.2	5125
8	70	10	20	7.5	4750
9	70	20	10	9.2	2490
10	70	30	0	10.5	720
11	60	0	40	6.2	6540
12	60	10	30	6.9	5310
13	60	20	20	7.5	4580
14	60	30	10	9.6	2505
15	60	40	0	10.5	980
16	50	0	50	6.2	5400
17	50	10	40	6.4	6045
18	50	20	30	6.5	6175
19	50	30	20	8.1	5675
20	50	40	10	9.7	2685
21	50	50	0	11.1	935
22	40	0	60	9.3	5235
23	40	10	50	7.1	5420
24	40	20	40	7.4	5150
25	40	30	30	7.4	5240
26	40	40	20	9.1	4950
27	40	50	10	10.7	2450
28	40	60	0	11.2	1390
29	30	0	70	7.7	4955
30	30	10	60	7.6	5130
31	30	20	50	7.7	5240
32	30	30	40	7.7	5010
33	30	40	30	9.2	4305
34	30	50	20	8.4	3625
35	30	60	10	10.6	1705
36	30	70	0	12.6	940
37	20	0	80	7.8	4650
38	20	10	70	7.4	4770
39	20	20	60	7.4	5065
40	20	30	50	6.1	5015
41	20	40	40	8.0	4835
42	20	50	30	9.3	4030
43	20	60	20	9.7	3835
44	20	70	10	10.7	1705
45	20	80	0	12.9	885
46	10	0	90	8.7	4080
47	10	10	80	9.3	4230
48	10	20	70	9.7	4585
49	10	30	60	9.0	4465
50	10	40	50	9.0	4450
51	10	50	40	9.7	4255
52	10	60	30	9.6	4240
53	10	70	20	9.9	3500
54	10	80	10	11.3	1630
55	10	90	0	12.0	755
56	0	0	100	9.2	3495
57	0	10	90	9.0	3980
58	0	20	80	8.4	4200
59	0	30	70	8.1	4295
60	0	40	60	8.0	4585
61	0	50	50	8.3	4300
62	0	60	40	9.4	4025
63	0	70	30	9.4	3975
64	0	80	20	10.0	3375
65	0	90	10	11.0	1630
66	0	100	0	14.0	780

Informal Contracts Bill Now a Compromise

WASHINGTON, D. C.—The conferees on the so-called "illegal contracts" bill have finally come to an agreement, and the Senate and House will be called upon within a few days to ratify the compromise measure. The bill provides for the settlement of informal contracts of the War Department by the Secretary of War, with provision for an appeal in the case of disagreement to the United States Court of Claims. In many industries, an agreement has already been reached with the Government as to the basis of settlement under the contracts.

The informal contracts subject to settlement under this law will total more than $2,750,000,000. This covers such contracts in both the United States and in various foreign countries in which the War Department officials made purchases.

Lime Association Issues Two New Agricultural Bulletins

PROF. A. E. GRANTHAM, Director of the Agricultural Bureau of the Lime Association, Washington, D. C., is the author of an interesting four-leaf bulletin on "Legumes and Lime." This bulletin is No. 1 of the series to be issued by the Lime Association. It treats of systematic rotation, proper liming and the growing of legumes for more profitable yields, also on winter liming as a recognized farm practice.

Under the title "A Catch of Clover," Bulletin No. 2 will be ready for distribution in the near future. It is written to promote the use of lime when clover is sown, and for this purpose should be circulated promptly in those sections of the country where red clover grows. The price of it will be at the rate of $7.50 per thousand regardless of quantity ordered, plus cost of handling shipment.

Good Roads Promotion and the Farmer

Farm Institute Meetings as Mediums for Promoting and Crystallizing Road-Building Sentiment

By John H. Voorhees
New York State College of Agriculture, Cornell University, Ithaca, N. Y.

SOME TIME AGO I clipped the following editorial from a newspaper. I regret that I have no record of the date, city or paper but this makes little difference because it is applicable almost every where.

CONCRETE ROADS AND 11 CENT MILK

We compliment the Portland Cement Association for an advertisement in the current periodicals. It achieves the varied object of proclaiming at once the advantages of good roads, the use of motor trucks, the value of concrete and the advantages of organization in such a matter as the distribution of milk. In the city of Milwaukee, of near one-half million inhabitants, milk costs 11 cents a quart. In most cities it is 13 cents or more. This means a saving to the people of Milwaukee of around a clean million dollars a year.

The advertisement gives three reasons for this result: well-organized distribution, ample milk supply and low cost of hauling. And it avers that all three of these are the natural consequence of a system of 129 miles of concrete highways radiating from the city. Only a small portion of the Milwaukee milk supply comes in by rail. The most of it is hauled by motor trucks over these concrete roads. As a sample of the saving, they quote the president of the largest dairy company of that vicinity as saying that where one man with two horses, which had to be changed every other day, formerly could haul about forty cans a day, now a little two-ton truck will haul about one hundred eight-gallon cans, making two trips instead of one.

The advertisement closes with the pertinent question; how much of your milk bill is for bad roads?

Of course, I do not know the authenticity of this editorial or how reliable the figures are. But it seems to me that city people do not fully realize or appreciate how dependent their welfare is upon the welfare of the country. The National Education Association recently issued a pamphlet in which it says: "The weakest link in the chain of the nation's education and civilization is the rural school. It must be strengthened, let the cost be what it may. If the rural school fail, rural civilization will fail; if rural civilization fail, American civilization will fail."

Here is food for though for all of the American people; and the producers of road-making materials may well stop to consider their part in any program for the betterment of rural civilization. As a matter of fact there is no reason why they should not use some initiative in the problem of better roads, which so materially affects rural welfare.

During the past six months it has been my fortune to travel among the farmers of New York State. A large part of my work has been lecturing on soil fertility and crop production. Much of my work has been in cooperation with the local farm bureau manager. At many of these meetings farmers are asked to present the problems of their respective communities and at ninety per cent of these meetings the subject of better roads is introduced and discussed. Little ever comes of these discussions because the farm bureau supported by federal, state and individual funds can only direct the attention of the local authorities to existing conditions, and in most cases the farm bureau manager has no knowledge of how to attack the problem without involving himself in commercial activities.

At this time when there are many problems confronting the people in the readjustment of conditions and while governing bodies and people alike are discussing internal development as a possible solution of the problem of efficiently utilizing labor, there is an opportunity for the producers of road-making materials to use their initiative to bring about more and better road building.

This initiative may be manifested in many ways especially in the rural districts. It may be done by advertising, but it is my opinion that a systematic study of the needs of communities in this respect should be made. There should be complete information based on facts to show the prosperity actually brought to rural districts by good roads. I was impressed with the improvements brought to the eastern shore of Maryland following the building of the concrete roads which are a mark of their progress.

There should be information regarding the best types of roads, the cost, the most economical supplies of road materials and this information should be placed at the disposal of the farmer. Why is it that talks are never given at Farmers Institute community meetings? Good roads affect the prosperity of rural communities. Why is it that State Colleges and Agricultural Experiment Stations have no departments of good roads, no studies of good roads?

The Farm Bureaus may be made an asset if properly approached. He should have this information both in general and as it applies to his county and its various communities. He should be informed of the best methods necessary to obtain funds for road building. The Farm Bureau Agent is too busy to devote much time to securing the facts necessary to crystallize the efforts of his people for betterment of this kind. The State College recognizes this and has specialists in its various departments who work with the farm bureau agents in studying their respective lines and who help to bring information before the people.

It follows that reliable information regarding these points placed in the hands of the State Colleges of Agriculture and the Farm Bureau managers by the producers of road building materials will lead to greater activity in this form of internal development and greater prosperity will result both to the country and city dweller.

AT THE HEAD of all sciences and arts, at the head of civilization and progress, stands—not militarism, the science which kills; not commerce, the art which accumulates wealth—but agriculture, the mother of all industry and the maintainer of human life.

—James A. Garfield.

THE POINT RAISED by Mr. Voorhees is very pertinent to the present road improvement agitation. It hits straight at the problem of which element (or elements) in our population is most benefited by improved roads. It involves the divorcing of Federal road supervision from the Department of Agriculture and the placing of it under a commission, possibly to be dominated by motor vehicle manufacturers and owners.

Are not highway promoters and agitators making a mistake to cater to the automobile joy-riding element of the public in advocating a billion dollar transcontinental highway system at the expense of the great food-producing and food-consuming public? Is not the greatest strength always on the side of the greatest economic gain?

Open Price Policy of Trade Associations

Is Not a Violation of Anti-Trust Laws—Is Merely a Demonstration of Confidence and Fair Dealing

A LARGE NUMBER of business men are beginning to inquire whether the "open price policy," as practiced by a number of trade associations, is not in violation of the Sherman anti-trust law. The operation of the "open price policy" is this: At the meetings of the Association the contracts entered into by the various members of the Association are open for inspection, and each member knows the prices which the other members are getting for their goods.

The law states that "Every combination * * * or conspiracy in restraint of trade or commerce among the several states * * * is hereby declared to be illegal." In the various decisions under this law it has been held that not only is any agreement illegal which is formed for the purpose of restraining trade or commerce, or of limiting competition, but that any agreement is illegal which in fact does restrain trade or limit competition, whatever may be its avowed object.

Result Not Intention the Criterion

In one case it was held that the Government need not prove "that the agreement was entered into for the purpose of restraining trade or commerce, or for maintaining rates above what was reasonable, if the necessary effect of the agreement was to restrain trade or commerce, no matter what the intent was upon the part of those who signed it. Purpose or motive is of no moment provided the contract or agreement directly provided for the suppression of competition, or when such a result as a matter of law must necessarily occur."

From these decisions it is clear that the "open price policy" could not be used as a blind to control prices or "divide the business." But assuming that such a policy is decided upon as a legitimate means of promoting the business of the members of any trade association, will the members of the association thereby render themselves liable to prosecution under the Sherman Law? And if such prosecution were begun, from malicious motives, would it probably result in conviction?

Open-Price is Price-Tagging Goods

There is nothing new in the "open price policy." Wherever it is practiced the members of the trade association are doing only what every merchant does when he displays his goods with a price ticket on them. In fact they are doing less than the merchant, for they disclose only the prices at which goods have already been sold. And producers who have a "fixed price" for their products make known to all, including their competitors, the price at which they sell.

Among merchants and manufacturers it is generally regarded that the disclosing of prices to competitors is an evil, to be guarded against whenever possible. Persons are employed to visit the stores of rivals and purchase certain articles for comparison. And the general result of the publicity is to keep prices down to the lowest possible point.

Legitimate Promotion Method.

The conditions that govern various lines of trade differ, but it would seem that the "open price policy" should meet the approval of the buyer, especially if the buyer is informed as to the prices paid by his competitors. In the history of business secrecy has been one of the strongest weapons of the business pirate, and open dealing the mark of the honest tradesman. There seems to be no reason to think that it will be otherwise in the future.

It is quite certain that if a trade association wished to control prices they would compare prices before the contracts were made, rather than after. That the members of any given association are willing to give this information to each other indicates that they have come to regard business on the high plane of giving service to their fellows, and are concerned only in the giving of good service at a reasonable price, instead of giving as little as they must and getting as much as they can.

Proofs Needed for Convictions

In order to secure a conviction it would be necessary to prove either (1) that the object of the Association, or of the agreement entered into by its members, is really to restrain interstate commerce, or (2) that the result of the action of the members is really to restrain such commerce. Both of these are matters of fact which would have to be proved or disproved in any particular case. It is to be noticed, however, that if such comparison of prices had an influence on commerce it would not, in itself, make it a violation of the law. As Justice Peckham said, "An agreement entered into for the purpose of promoting the legitimate business of an individual or corporation, with no purpose to thereby effect or restrain interstate commerce, and which does not directly restrain such commerce, is not, we think, covered by the Act, although the agreement may indirectly and remotely affect that commerce."

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Lime Association Will Issue Bi-Weekly Prospect Bulletin

MEMBERS of the Lime Association, are to have another big advantage from membership. General Manager Robert F. Hall announces:

"That member companies may be fully informed of specifications including lime products, we shall issue a Bi-Weekly Prospect Bulletin. Until recently the amount of work in prospect has not justified such a publication, but now that conditions are improving we feel it will be of value.

"These bulletins will contain leads for business; for instance, the name of the architect or engineer, the approximate cost of the project, the contractor (if contract has been awarded) the approximate yardage of concrete or plaster, lime requirements, etc., and any other information that may be of assistance to member companies in getting orders.

"These bulletins will be sent only to member companies, and not, like the Weekly Letter, to the complete list of lime manufacturers. We believe it proper that valuable information leading directly to orders should be confined to members of the Association.

"The first bulletin will be mailed Wednesday, February 12, and succeeding issues every second Wednesday."

Appointments by the Indiana Limestone Association

R. M. RICHTER of Bedford, Ind., secretary of the Indiana Limestone Quarrymen's Association has announced the following appointments: George B. McGrath, Washington, D. C., as eastern and southeastern district manager; C. R. Yanson, Bedford, Ind., in charge of the central and central southern districts; J. R. Sargent, Topeka, Kans., the western and southwestern district. The association aims to render special service to users of Indiana limestone and conducts an educational program. These appointments indicate that the association has great confidence in the future of business, and especially for Indiana limestone in the whole country.

Why Pick on the Material Man?

Persistent Agitation in Illinois That Crushed Stone, Sand and Gravel are "Free"

BECAUSE A SIXTY - MILLION DOLLAR bond issue will not build as many miles of highway as their engineers estimated, it would (based on prices in 1916), certain officials in Illinois are fostering persistent attacks on material men. The following editorial from the Chicago "Tribune" of February 10 is a sample:

THAT ROAD MATERIALS BUNCOMBE

Let not the sellers of materials for Illinois' good roads problem delude themselves; the $60,000,000 is for decent highways, not for profiteers.

We are beginning to hear covetous suggestions that "because of the war," materials are going to be high and thus our $60,000,000 may not go as far as we intended. Who is spreading this insidious gospel of sleek profit?

More than 90 per cent of the materials that go into road building is stone. Who is furnishing the brilliant afterthought that stone is going up? How does the war affect stone that has lain in the quarries of Illinois since the azoic?

Illinois has always had free stone. It can be furnished aboard cars at something more than $1 a yard; and there is no waste, because the farmers are eager for the dust byproduct for their fields. Abolish the idea, right now, that the purchase of stone is going to eat into the people's $60,000,000.

The cement makers—are they interested? And do we suddenly perceive that cement has gone out of sight? Who, in the presence of $60,000,000, is sending it out of sight?

Those who hope to profit above a just degree must be reminded that the state of Illinois is not totally incapable of maintaining a cement plant, however ill advised such a project may be, in consideration of future operation. For the purposes of the present program the state can make cement just as well as private manufacturers.

It was inevitable that $60,000,000 would set some mercenary chops a-drooling. But they had better turn away. The pickings are not good. The people were promised a road system honestly built. It is the business of the state administration to see to this honesty. Governor Lowden already has warned the material men. The subject is not going to be dropped.

Fortunately a meeting and luncheon of the material men in Chicago on the day following this unjustified attack quite effectively disposed of these charges. Representatives of all the building material industries were present. The "Tribune" reported the meeting in part as follows:

Offer to Open Books

"Each representative present had figures from his books showing the part that labor plays in producing materials. Nearly every one offered to open their books to any reputable person to verify his statements. They asserted vigorously and repeatedly that the increased cost of building materials is more than justified by the advance in wages and freight rates. One material will serve as illustrative—cement.

B. F. Affleck, president of the Universal Portland Cement Co., predicted that if the government were to fix the price it would be 20 to 30 cents higher per barrel than now asked.

"I notice a builder says that the price in the last year has jumped from $1.35 to $2.25," he stated. "The facts are the price now is $2.25, last year $2.11, and the year before $1.86.

Cites High Freight Rates

"The price in Chicago today is the lowest base price in the country, with the exception of two or three very small centers. During the first half of 1918 we shipped from the Chicago plant a little less than 2,000,000 barrels at a cost of $796,000. That was an average freight cost of 37 cents per barrel. The last half of the year we shipped 2,087,000 barrels at a cost of $1,190,000, or a freight charge per barrel of 57 cents. The increase in freight cost was 19 cents, or 51 per cent.

"The increases in cost of production in 1918 over 1915 are approximately as follows: Raw material, 20 per cent; fuel, 115 per cent; labor, 127 per cent; mill overhead, 110 per cent; general expense, 49 per cent; packing and loading, 167 per cent, and care of empty sacks, 62 per cent. Common labor in 1915 cost 19.5 cents per hour, in 1916 27.5 cents, in 1917 33 cents, and in 1918 42 cents. That is an increase of 115 per cent. Take now what we call turn men. In 1915 they received $2.30 a day, $3.20 in 1916, $3.85 in 1917, and $5.67 in 1918. That is an increase of 146 per cent."

The Case of the Mineral Aggregates Producer

ROCK PRODUCTS filed the following protest in the interest of producers of crushed stone and other mineral aggregates.

Feb. 8, 1919.

Editor, Chicago Tribune.

Dear Sir: The editorial in this morning's "Tribune" headed "That Road Materials Buncombe" is so flagrantly unfair to the material men that I am sure it was written without a fair investigation of the charges made.

Illinois and no other state have "free" stone any more than they have free coal or free iron ore. Limestone is a mineral deposit which in its native state has some intrinsic value.

However, it is a notorious fact that many quarrymen have never been educated to the point of allowing for any intrinsic value, that is, of making a "depletion" charge, which is justified in any mining enterprise, if it hopes to liquidate its capital on the exhaustion of its mineral deposit.

A quarry property to produce a thousand tons of stone a day, a very modest plant, cannot be built today with an investment of less than $250,000 or $300,000. It is a hazardous business, exactly in the same class as a mining enterprise and by all the rules of business is entitled to more than ordinary return on investment, for that reason. But it is also notorious that failures of crushed stone companies are frequent, and they are not due to watered capital, either, for there is no banker or financier who will risk investment in the business. Practically the whole industry is financed by the men who operate the plants, and in nine cases out of ten whatever profits there are in the first ten years of business are put back into the plant.

Quarry owners very frequently neglect to add any salary for themselves to the expense of operating their plants. The majority of quarrymen feel lucky if they can clear 10 per cent on their investment, which I think you or any other business man will consider not an excessive profit.

Over 90 per cent of the cost of crushed stone is the cost of the labor in getting it out. Allow me to quote from the "Record and Guide," the New York real estate weekly journal, of Nov. 2, 1918, the following paragraphs from "Relation of Labor to Total Building Cost," by Alfred C. Bossom.

"A client possessing a very extensive estate in the Adirondacks came to me just before the war started and desired to build a large cut-stone house and to take the stone from his own mountains. I called for two estimates; one using his own stone existing right on the site, and as an alternative using a good Indiana limestone, which by the way had to be transported several hundred miles. When the bids came in it was vastly cheaper to use the Indiana stone rather than his own local material.

"Why was this?

"It was because the determining or controlling cost was due to the value of the actual labor, as the virgin material itself had practically no value whatever."

The days of dollar-a-yard stone were the days of $1.75 and $2.00 a day labor. Also bear in mind that the crushed-stone producer pays from 100 to 500 per cent more for every piece of equipment he uses than he did in 1916 and that equipment in a stone plant is notoriously short lived. A very conservative figure for depreciation is 10 per cent—although a great many quarrymen have not yet been educated to the point of making any depreciation charge! Do you know that for every $100 of payroll a crushed-stone operator has to pay from $3 to $9 for employees' accident or employers' liability insurance. He did not have to in the day of "free" stone.

It would do the state and people of Illinois far more good if you would direct your editorial fire against the proposed increase in freight rates on crushed stone, sand, gravel and slag. If you think stone is not worth a dollar a yard, certainly you do not think that it is worth 85 cents to haul it five miles or a dollar to haul it twenty miles. Yet that is what the railways propose to charge for a two-line haul, which is now done for less than half those figures. I think a little consideration by any reasonable man will show that it certainly costs more to mine, crush, screen and load the stone, maintain a half-million dollar plant and a large working organization than it does to haul the material 5 to 20 miles.

All that is here said of crushed stone, applies with equal force to sand, gravel and slag, and to a large extent to cement, which is the manufactured product of crushed and pulverized limestone and other ingredients.

Yours very truly,
ROCK PRODUCTS.
Nathan C. Rockwood, Editor.

State and Nation Seek Solution to Lower Prices

Nation's Cabinet Considers Stabilization of Prices

WASHINGTON, D. C.—The matter of stabilizing prices for many commodities has been undertaken by Secretary of Commerce Redfield, following conferences with business men in practically every line. The matter was taken up first at a cabinet meeting, and later with representatives of the various industries.

At these meetings it developed that a large latent buying power exists in the country which needs only a fair adjustment of prices to become active and effective; that there is no prospect of the restoration of pre-war prices and the prices of everything will remain higher than before the war; that it is highly desirable to take steps to reduce the prices of all abnormally high commodities to their proper level, and that the situation requires the utmost speed.

The Secretary of Commerce has asked President Wilson for his approval to the appointment of a committee to deal with the question. This committee would be comprised largely of the heads of the various divisions of the War Industries Board, and would confer with committees or representatives of the various industries producing basic materials, such as iron, steel, cement, brick, textiles, leather, etc., for the purpose of ascertaining the present fair selling prices of materials.

"Since prices of one commodity affect other commodities, producers wait for one another to take the first step," said Secretary Redfield. "Such a course of procedure involves much unemployment and a loss to both labor and capital. It was the sense of the meeting that the fine spirit of voluntary co-operation in industry which had proved such a valuable factor in the conduct of the war should be availed of to ease and expedite the processes of readjustment and that the manufacturers of the country would be willing to take the first step.

"It is contemplated that the proposed committee shall call into conference the representatives of the basic industries of the country to examine conditions in industry with a view to the formulation of a scale of prices at which the Government departments and other buyers would be justified in buying freely and at which the manufacturers would be willing to sell with a view to maintaining or restoring business activities to a full volume. It is manifest that time is the very essenec of the problem and that therefore the appointment and action of the committee should proceed with all possible speed."

Illinois Senators Propose State Owned Cement Plants

A DISPATCH from Springfield, Ill. to the Chicago Journal, is as follows:

Two bills introduced in the senate, one by John D. Turnbaugh of Mount Carroll, and the other by John Dailey of Peoria, provides for the purchase or construction and operation by the state of cement plants.

The Turnbaugh measure has the advantage of Gov. Lowden's approval. The Dailey measure provides, in addition, that the state may take the plants it needs through the right of eminent domain and specifies that convict labor shall not be used in the manufacture of cement by the commonwealth. The convict labor restriction in the Dailey bill was put in, it is said, at the request of labor representatives. Introduction of the bills brought to light a predicament in which the state finds itself concerning the price of cement, which is to be the big factor in the construction of the roads.

Seeks Cheap Price on Cement

"My bill," said Senator Turnbaugh, "is intended to permit the state to get its cement for the roads just as cheaply as possible. I am told that the present market price of cement is about $2.40 a barrel, while it can be produced for about half that amount and still a good profit made. There is no intention, nor is authority given, for the state to enter into competition with the cement companies, but it will manufacture cement solely for its own uses."

From the highway bureau of the department of public works it was learned that the cost of building a mile of road at this price demanded for cement now would be about $24,000. This, it was said, the state could not afford.

A fair price, it was said, and a price at which the work could be done if the state owned its own plants, is $18,000 to $20,000 for an eighteen-foot road; $18,000 for a sixteen-foot road and $12,000 for a ten-foot width. In 1915 and 1916 considerable work was done for $15,000 a mile.

Free Gravel for Good Roads Making is Offered to Illinois State

PAUL RAMSER OF ALMA, Ill., in a letter to State Senator Henry M. Dunlap, offers to give 2,000,000 car loads of gravel free to the state for road building purposes. The senator it is understood has turned the proposition over to the department of public works for consideration.

"I own 440 acres of gravel deposits in hills or small mountains at Tamms, Alexander County, Ill., constituting approximately 2,000,000 carloads," said Mr. Ramser's letter. "I would give to the state the privilege to move gravel for five years, placing no limit on quantity."

Mr. Ramser further explains his offer as follows in a letter to ROCK PRODUCTS:

"The tender of free gravel was made pursuant to an article appearing in the Chicago Tribune, February 7, relative to high cost of road materials which would no doubt defer the state road project.

"The hills are in the main gravel in loose formation, of a flinty nature and angular, which wedges and becomes very compact by exposure to elements. It is said to make the least dust of any road material. There is a beautiful road made of this material adjacent to the deposit."

In answer to a question of ROCK PRODUCTS whether the state would not have to build a plant for digging, conveying, screening, washing and loading, he replied:

"A loading place for this gravel is only a few hundred yards from the M. & O. spur and with access to gravel the only immediate equipment required would be a steam shovel. My gravel tract has never been exploited. I have no equipment of any kind on the ground."

A conclusion that might be safely drawn from the letter is that all the gravel is above the ordinary level of the ground, and that after the hills and small mountains are removed a level tract will remain.

Illinois Legislature Asks for Reduced Freight Rates

THE legislature of the State of Illinois has joined the ranks of Ohio and Indiana in passing a resolution condemning the proposed freight rate increases on crushed stone, sand, gravel and slag and asking that reductions be made instead.

Export Demand for Building Materials New Factor

Manufacturers Receive Encouragement from Several Other Sources Also—New York State Needs More Commodities Than Are on Hand—Federal Government May Buy More Lime and Cement—Cement Makers' Production Greatly Increases

NEW YORK.—Upon the eve of a state-wide conference at Albany on the question of building material price changes new drains upon available supplies developed at the week end, according to The Dow Service Daily Building Reports.

The Jova Brick Co. were requested to figure prices delivered, dock, Belgium port, on one million brick and put their price in on Saturday. It was reported here that similar inquiries had been made of one or more manufacturers supplying the Boston and Philadelphia markets. It was made known to the trade that an actual order had been placed, filled and would be shipped this week, for 2,000 barrels of lime for building purposes for the west coast of East Africa.

Government Surplus Smaller Than Announced.

The building material market had barely recovered from the full realization of the significance of these actual export factors in the domestic building material situation when it was announced officially by Brig. Gen. R. C. Marshall, Chief of the Construction Division of the War Department, that instead of the Federal Government having on hand a surplus of building materials to dump back upon the building trades the War Department said that "it is expected that cement and lime will have to be purchased for the completion of work now under way by this division." It advised, however, that small quantities might be procured in the vicinity of New York by communicating with the quartermaster at each of the projects.

State Architect Says There Is Shortage.

Before the New York State Association of Builders' meeting at Albany State Architect Lewis F. Pilcher declared that the state of New York, with the biggest construction program in its entire history, was handicapped, not by the differences of labor or lack of money, but by the ability of the building material manufacturer to turn out sufficient construction commodities to meet the demands of the state alone, a condition, he said, that was actually characteristic of practically every great community throughout the country.

The week's report from the window glass industry supplying that part of the country lying east of the Mississippi, bears out entirely the state architect's view when it is stated officially that although glass labor had received an increase of 10 per cent in wages, that the actual production during the entire year would be only one-half that of normal. There is significance in the fact that the wage adjustment has been made for a full year, indicating that the glass industry is doing its part toward stabilizing the market for building materials.

Sand quotations were being readjusted at the week end. Lower prices will probably prevail. Building stone is in a most advantageous position, there being a large stock on hand in this market with prices probably proportionately lower than the regular market. The building stone interests of New York especially, have anticipated the scarcity of basic building materials and have for the last year accumulated large surpluses of exterior limestone, sandstones and granites and interior marbles, for this year's demand. Recent freight rate advances have been discounted by this foresightedness and the result is that prices for this material are closer to normal than almost any other commodity.

Cement Production Increasing Rapidly.

Portland cement is most barometrical of the present building material market, as to inquiries, shipments and production. Inquiries in December were twice those in November, but inquiries in January were three times that of December, which shows a healthy increase in the trend of all kinds of construction work, road, engineering and building. In this section of the country more mills ran in January than in January a year ago when the country was at war and some of the larger companies are piling up product for which they believe there will be a great demand later on.

More Building Contracts Help New York Situation

NEW YORK.—Concrete evidence of an improved building situation developed the week ending February 8, when a number of projected building operations, all of a high character, were announced. The local situation was brightened by the award of contracts for structures designed some time ago, in some instances before the outbreak of the war and held in abeyance on account of it, says the Record and Guide.

While the major portion of the new projects are to be located within Greater New York, the territory contiguous is well represented. Projects are diversified and include structures of almost every character. Earlier predictions of a house-building movement of large proportions are being borne out by the recent announcement of plans made for many modern apartment houses and one- and two-family dwellings. Erection of large private country residences and the development of handsome estates within easy access of the city also are indicated.

Greater New York has experienced one of the best weeks in nearly two years' time when the number and importance of its new structural projects are considered.

Architects are going ahead with their plans and owners are making their financial arrangements to build, in the hope that the dispute between labor and employers will be speedily settled and the industry permitted to gain its normal stride without further hindrance.

Building material dealers are growing more optimistic in regard to the future and almost daily new inquiry is manifesting itself in this field. Prices are remarkably firm and there now seems to be no possibility of a reduction from the existing levels. Cement, lime and plaster are being held at the levels quoted for the past two weeks or more.

NEW MACHINERY AND EQUIPMENT

Convertible Tractor-Railway Shovel-Crane

THE Thew Automatic Shovel Co., Lorain, Ohio, has added a new line to its Type 00 series of power shovels. This new machine is so designed that, with very minor changes, it may be equipped for steam, electric or gasoline operation. Change from one form of power to another can readily be made in the field, and at reasonable expense.

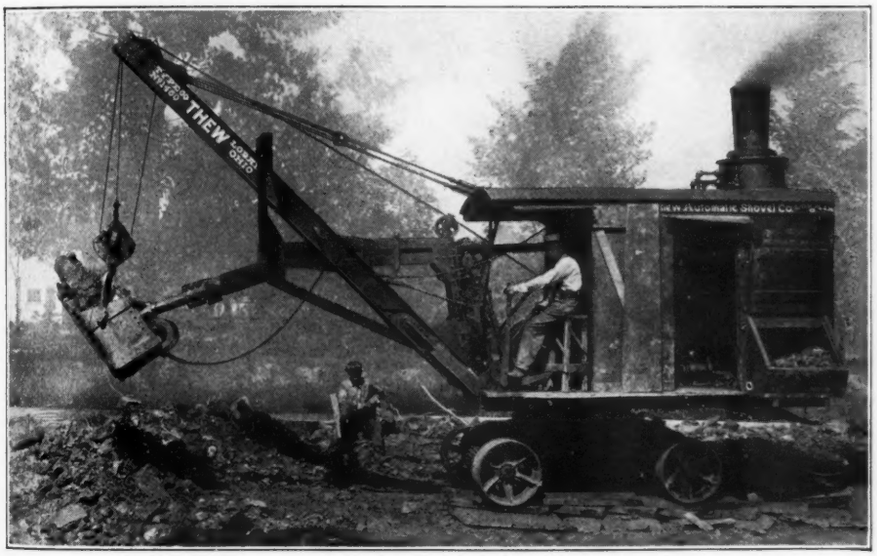
Following the Thew standards for full-circle swing shovels, independent double reversing engines are employed for hoisting, crowding and swinging when the power is steam. For electric and gasoline service, a single motor is used, operating at constant speeds. The various motions are controlled through reversing frictions.

When equipped as a shovel (Fig. 1), the machine is regularly mounted upon a truck with wide-tired traction wheels, with both hand and power steer. It is self-propelliing at speeds approximating 1½ miles an hour.

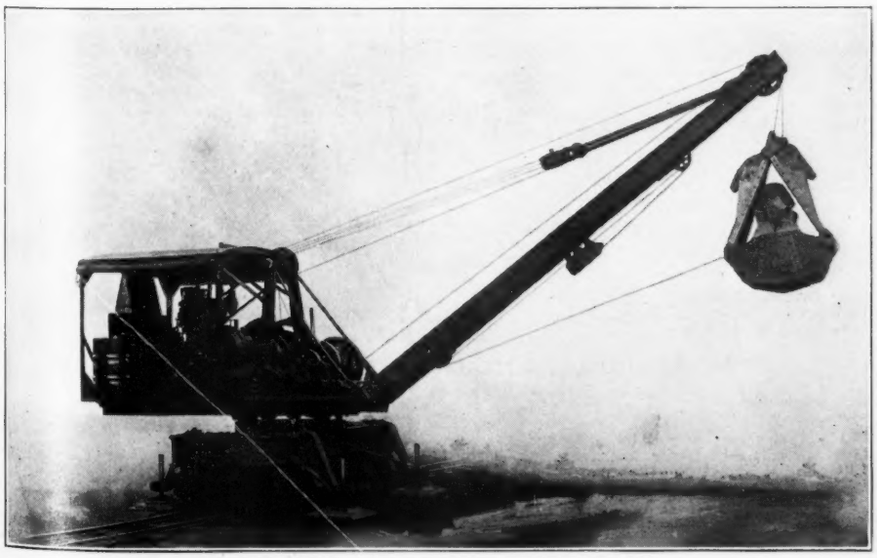
The shovel boom is of the horizontal crowd design. The Type 00 weighs 14 tons and regularly uses a ½-yard dipper. It is claimed to dig any clay, earth or thoroughly blasted material at the rate of one complete dipper per minute or 300 cu. yds. per day.

By adding an auxiliary shaft carrying two drums, and the substitution of a longer and lighter boom, the shovel is converted into a crane (Fig. 2) capable of handling a ½-yard clam shell bucket, with a working radius of 25 ft. When equipped for electric or gasoline motor, this auxiliary shaft controls the dipper crowding motion. The only change, then, from shovel to crane lies in the exchange of booms.

For use on narrow gauge industrial railways, the Type 00 crane superstructure is mounted upon double trucks, distributing the weight over eight wheels. Inasmuch as the usual gauge of such railways is 60 centimeters, or approximately 24 in., it is evident that the use of jacks or outriggers is necessary when operating as a crane. With jacks set, loads of 10,000 lbs. may be handled, the usual rating for a five-ton crane.



New convertible shovel-crane as a steam shovel

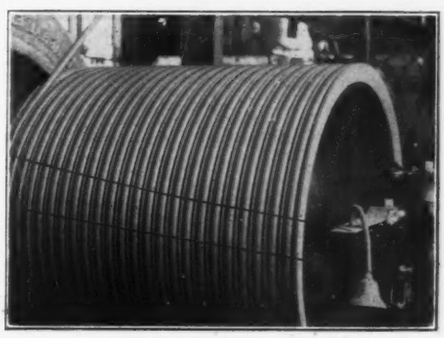


New convertible shovel-crane as a locomotive crane

Safety Device For Multiple Rope Drive

THE ACCOMPANYING illustration shows the manner in which the chief engineer of the power plant of the Newago Portland Cement Co., Newago, Mich., guards against the wearing and breaking of a multiple rope drive.

Two cords are stretched across the face of the pulley carrying the ropes; one is so arranged as to jingle the bell shown in the right-hand corner of the picture, and the other makes an electrical contact between two plates, whenever a strand of the ropes becomes frayed enough to come in contact with the strings or cords. The electrical contact shows a light and rings an alarm bell at the switch board so that ample warning is given of any tendency for one of the strands to break.



Alarm device for rope drive

The Rock Products Market

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Cambria, N. Y.—(All thru 15 mesh) Analysis, $CaCo_3$, 93.94%; $MgCo_3$, 4.24% 2.00

Coldwater, near Rochester, N. Y.—(80% thru 100 mesh) Analysis, $CaCo_3$, 56.77%; $MgCo_3$, 41.74%..... 3.00

Danbury, Conn.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk..... 2.75

Gasport, N. Y.—Analysis, $CaCo_3$, 97% —50% thru 100 mesh..... 2.00

Hillsville, Pa.—(90% thru 100 mesh) in 80 lb. ppr. bags, $4.50; bulk..... 3.00

Jamestown, N. Y.—(90% thru 100 mesh)—Bags 2.50

Pownal, Vt.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk 2.75

Walford, Pa.—(70% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 100% thru 10 mesh; 50% thru 4 mesh), paper sacked..... 4.50
Bulk 3.00

West Stockbridge, Mass.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk..... 2.75

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, $CaCo_3$, 96%; $MgCo_3$, 75%..... 2.00

Bedford, Ind.—(90% thru 10 mesh) Analysis, $CaCo_3$, 98.5%; $MgCo_3$, 0.5% 1.75

Columbia, Ill., near East St. Louis —(⅛" down) ..... 1.25@1.80

Greencastle, Ind.—(50% thru 50 mesh) Analysis, $CaCo_3$, 98%..... 1.75

Lannon, Wis.—(50% thru 50 mesh) Analysis, 54%, $CaCo_3$; 44%, $MgCo_3$ 2.00

Marble Cliff, O.—(50% thru 100 mesh) Analysis, $CaCo_3$, 86%; $MgCo_3$, 8%.... 3.00

Marblehead, O.—(50% thru 100 mesh; 60% thru 50 mesh; 100% thru 10 mesh)—Analysis (Min.), $CaCo_3$, 32.03%; $MgCo_3$, 3.75%. Bulk, $3.00; ppr. 80 lb. sack..... 4.50

McCook, Ill.—(100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru No. 100) Analysis, $CaCo_3$, 54.10%; $MgCo_3$, 45.04% 1.00

Milltown, Ind.—Analysis, $CaCo_3$, 98% 1.50

Montrose, Ia.—(90% thru 100 mesh).. 1.25@1.50

Muskegon, Mich.—(50% thru 50 mesh) Analysis, $CaCo_3$, 53.35%; $MgCo_3$, 43.27% ..... 1.50@2.00

North Industry, O.—(50% thru 100 mesh; and pulverized limestone) Analysis, $CaCo_3$, 91%; $MgCo_3$, 1.63% 3.00

Piqua, O.—(90% thru 100 mesh)..... 2.50@4.00

Rockford, Ill. — Analysis, $CaCo_3$, 53.75%; $MgCo_3$, 44.35%..... 1.25

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛" mesh) Analysis, $CaCo_3$, 89.61 to 89.91%; $MgCo_3$, 3.82% 1.50

Stone City, Ia.—(50% thru 100 mesh) .50

Toledo, O.—Analysis, $CaCo_3$, 52.72%; $MgCo_3$, 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen)..... 1.80

Whitehill, Ill. — Analysis, $CaCo_3$, 96.12%; $MgCo_3$, 2.50%—
90% thru 100 mesh, bags..... 5.00
90% thru 50 mesh, bulk..... 1.50

SOUTHERN:

Fletcher, N. C.—(100% thru 10 mesh) Analysis, $CaCo_3$, 90%; $MgCo_3$, 80%. Paper, $3.75; bulk..... 2.25

Grovania, Ga.—Analysis, $CaCo_3$, 95%; $MgCo_3$, none—90%thru 50 mesh..... 2.00@2.75

Irvington, Ky.—(50% thru 4 mesh).... 1.90

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Auburn and Syracuse, N. Y.	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.	1.25, all sizes from stock piles.					
Burlington, Vt.			2.00@2.50	1.75@2.00	1.75	
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10				(local)	
Grove, Md.	1.50	2.25	2.10	1.90	1.50	1.35
Hagerstown, Md.	$2.00 for all sizes					
Hull, Canada	1.20	1.20	1.20	1.05	.80	
North Leroy and Akron, N. Y.	$1.00 for all sizes, including R. R. ballast					
CENTRAL:						
Alton, Ill.	1.85		1.45	1.35		
Belvidere, Ill.	1.00 for any size produced					
Bettendorf, Ia.	1.25	1.50*	1.50*	1.50*	1.50* (2300 lbs.)	
Chicago Switching District	1.30 cars to 2.35 by trucks, all sizes					
Columbia, Ill. (near E. St. L.)	1.25@1.80	.85@1.20	.95@1.30	.95@1.30	.80@1.20	
Detroit, Mich.	Various sizes $1.50 per net ton					
Dundas, Ont.	.65	1.10	1.10	1.10	.90	.90
Eden and Knowles, Wis.	.80	.80		1.00	1.00	1.00
Ft. Wayne, Ind.	Various sizes $1.60 per net ton					
Illinois, Southern	1.50	1.50	1.50	1.50	1.25	.90
Greencastle, Ind.	.90@1.25	1.10	1.00	.90	.90	.90
Lannon, Wis.	1.10 all sizes					
Lewisburg, O.	1.00		1.10	1.00	1.00	1.00
Linwood, Ia.	.60	1.45*	1.35*	1.25*	1.25*	1.25*
Mankato, Minn.				1.50	1.25	
Mayville, Wis.	.75	.75	.75	1.10	1.10	1.10
McCook, Ill.	1.00	1.60	1.00	.80	.80	.70@.80
Montrose, Ia.		1.10@1.20	1.10@1.20	1.00@1.10	1.00@1.10	1.25@1.35‡
Oshkosh, Wis.	1.00 in all sizes, Blue Limestone					
Ottawa, Can.	1.90	2.00	2.00	1.75	1.50	
River Rouge, Mich.	.80@1.00	1.25	1.25	1.25	1.25	1.25
Rockford, Ill.	1.25			1.25	1.25	1.25
Sherman and Hamilton, Wis.	All sizes $1.00 per ton					
Stone City, Ia.	.50	(1-inch 1.20)		1.10	1.00	
Toledo, Ohio	1.60	1.80	1.80	1.80	1.70	1.70
Toronto, Can.	1.55	1.95	1.95	1.95	1.75	1.75
	These prices include 90c freight					
SOUTHERN:						
Brookville, Fla.	.50			2.50		
Cartersville, Ga.		2.40	2.30	2.20	2.10	2.00
Fort Springs, W. Va.	1.00	1.00	1.60	1.40	1.30	
	Railway ballast 1.10 per cu. yd.					
Irvington, Ky.	.75			.90	.90	
Mascot, Tenn.		1.00@1.25				
Stephensburg, Ky.	1.20 any size					
Winnfield, La.	1.20	1.80	1.80	1.80	1.80	1.80
WESTERN:						
Atchison, Kans.	.50	1.50	1.50	1.50	1.40	1.40
Carthage, Mo.	1.50	1.50	1.25	1.25	1.25	1.25
El Paso, Tex.	.90 for all sizes					
Kansas City, Mo.		1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md. (vicinity)	1.25	3.15	2.75	2.50	2.40	
Birdsboro, Pa.	1.25	1.80	1.70	1.50		1.25
Branford, Conn.—Trap	.80	1.25	1.25	1.20	1.10	
Duluth, Minn.—Trap	.75	1.50	1.35	1.25	1.25	1.25
Farmington, Conn.—Trap	.80	.95	.95	.90		
Glen Mills and Rock Hill, Pa. —Trap	1.20	1.40	1.60	1.50	1.40	1.40
	R. R. ballast 1.40					
Little Rock, Ark.—Trap		1.75		1.75	1.50	1.35a
Millington, N. J.—Trap			2.00	1.80		
Montrose, Ia.—Trap		1.10@1.20	1.10@1.25	1.05@1.10	1.00@1.10	
Morristown, N. J.—Trap	1.85	1.75	1.75	1.60	1.40	1.40
New Britain, Conn.	.75	1.30	1.25	1.25	1.10	1.00
Richmond, Cal.—Trap			1.75	1.65	1.65	
Westfield, Mass.—Trap	.60	1.00	1.10	1.00	.90	.90

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Fair Oaks, Calif.—Cr. Bldrs.	.85	1.05	.95	.85	.85	
Hendlers, Pa.—Quartzite	.80	1.00	1.25	1.00	1.00	1.00‖
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.20‖
Richmond, Va. (Quarry)	1.00@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40
Stephensburg, Ky.	1.00@1.26 per cu. yd. any size Basalt and other kinds					
So. Richmond, Va.—Granite	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
Stockbridge, Ga.—Granite	.50	2.20	2.20	2.10	2.10	2.00
Toledo, O.—Slag	.75@1.25	.85@1.40	.85@1.40	.85@1.40	.85@1.25	.85@1.25
White Haven, Pa.—Sandstone	1.00	1.20	1.40	1.20	1.20	1.20‖

*Cubic yard. †Agrl. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Keystone, Ala.—(90% thru 50 mesh) Analysis, $CaCo_3$, 99.50%; $MgCo_3$, none 1.25

Ladds, Ga.—Analysis, combined carbonates, 96%—(All thru 10 mesh).... 3.50

Mascot, Tenn.—Analysis, $CaCo_3$, 52%; $MgCo_3$, 38%.
(90% thru 100 mesh)..... 2.50
(All thru 10 mesh)..... 1.75
Paper bags, $1.50 extra per ton; burlap, $2.50 extra per ton.

Stephensburg, Ky.—Analysis, $CaCo_3$, 98% ..... 1.00@1.50

Winnfield, La.—(50% thru 50 mesh).. 3.00

WESTERN:

Cement, Cal.—Analysis, $CaCo_3$, 95%; $MgCo_3$, 1% (50% thru 100 mesh).... 4.00@5.00

Elsberry, Mo.—(Pulverized) Analysis, $CaCo_3$, 99.29% ..... 1.85@1.95

Fresno, Cal.—(All thru 40 mesh) Analysis, $CaCo_3$, 98%; $MgCo_3$, 1%. (50% and 40% thru 200 mesh) sacked, $5.50; bulk, $5.00. (100% thru 40 mesh) sacked, $5.25; bulk.. 4.75

Kansas City, Mo.—(50% thru 100 mesh) 1.50

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:

Berkeley Springs, W. Va.—Glass..... 2.50@3.00
Bowmanstown, Pa.—Glass sand..... 2.50
Cedarville, N. J.—Glass..... 2.50@4.00
Hellam, Pa.—Glass..... 2.00
Dundee, Ohio—Glass ..... 2.00@2.50
Gray's Summit, Mo.—Glass..... 2.00@2.50
Mapleton, Pa.—Glass, damp..... 3.00
Glass, dry 3.50
Massillon, Ohio—Glass 2.00
Michigan City, Ind.—Glass sand..... .30@ .40
Millington, Ill.—Glass 2.00
Mineral Ridge, O.—Glass..... 2.10@3.00
Montreal, Can.—Glass 4.00
Montoursville, Pa.—Glass 2.00
Oregon and Wedron, Ill.—Glass..... 2.00@2.50
Ottawa, Ill.—Glass:
Large contracts ..... 1.75@2.00
All others ..... 2.00@2.50
Sands, Elk Co., Pa.—Glass sand:
Washed, wet 2.50
Selected, green 2.50
Silica and Pacific, Mo.—Glass..... 2.00@2.50
St. Mary's, Pa.—Glass sand—Green.... 2.50
South Vineland and Cedarville, N. J.—Glass 2.00
Sugar Grove, Ohio—Glass..... 2.00@2.25
Thayer, W. Va.—Glass..... 2.50@3.00

FOUNDRY SAND:

Albany District, N. Y.—Molding..... 2.00
Allentown, Pa.—Moulding..... 1.40@1.50
Bowmanstown, Pa.—Molding 1.50
Cleveland, O.—Moulding..... 1.25@1.75
Cleveland, O.—Core, at pit..... .33@ .75
Cleveland, O.—Core ..... 1.00@1.25
Columbus, O.—Molding ..... 1.50@2.00
Fleetwood, Pa.—Silica heating..... 2.15
Franklin, Pa.—Molding 2.00
Kansas City, Mo.—Core..... 1.00
Hellam, Pa.—Molding 2.00
Mapleton, Pa.—Molding, damp..... 3.00
Molding, dry 3.50
Montreal, Can.—Molding ..... 2.75@3.25
Montoursville, Pa.—Core, Molding..... 1.25@1.50
Michigan City, Ind.—Core..... .30@ .40
Millington, Ill.—Core, damp..... 1.50
New Lexington, Stamden and Layland, Ohio—Moulding ..... 2.00@2.25
Ohio—Various points:
Fine molding ..... 2.00@2.25
Coarse molding ..... 1.75@2.00
Shipments between Nov. 1 and April 1, 75c per ton added.
Ottawa, Ill.—Core, Steel Molding..... 2.00
Ottawa, Ill.—Sand blast sand..... 2.50@2.75
Ottawa, Ill.—Molding ..... .65@1.00
Thayers, Pa.—Core ..... 2.00@2.25
Thayers, Pa.—Molding 1.25
Utica, Ill.—Molding..... .75@1.00
Wedron, Ill.—Molding ..... .75@1.00
West Albany, N. Y.—Molding..... 1.75@2.25
Zanesville, O.—Moulding ..... 2.00@2.25

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Bowmanstown, Pa.		1.20	1.10			
Buffalo, N. Y.			1.00 cu. yd., all sizes			
Buffalo, N. Y. (Niagara River)	1.00	.85	.80	.80	.80	.80
Libby's Pit, Leed's Junct., Me.	1.00@1.15	.50@ .75	1.50	1.45	1.35	1.25
Morristown, N. J. (from stge.)		.70		1.20	1.20	
North Wilbraham, Mass.		.60*	2.00*		1.25*	
Washington, D. C.—Wharves....	.75	.75	2.00	1.40	1.20	1.20
CENTRAL:						
Algonquin, Ill.			All grades .50 per cu. yd. (3,000 lbs.)			
Barton, Wis.	.75	.70	1.00	.70	.70	.70
Beloit, Wis.	.40	.40	.50	.40	.40	.40
Cherokee & Rock Valley, Ia....		.40				.90
Chicago, Ill.		.95@1.05			.95@1.05	
Cincinnati, Ohio	.40@ .50	.40@ .50	.40@ .50	.50@ .60	.50@ .60	.50@ .60
Columbus, O.	.60	.60	.60@ .65		.65@ .70	.60@ .70
Des Moines, Ia.	50@1.00	.50	1.50	1.50	1.25	1.25
Earlestead, Mich.	.55	.55		.85	.75	.75
Elgin, Ill.		.40	.40	.40	.40	.40
Escanaba, Mich.	1.00	1.00	1.20	1.20	1.20	1.00
Fort Dodge, Ia.	1.00	1.00	1.75			1.75
Grand Rapids, Mich.		.40@ .45	.80@ .90	.75@ .85	.65@ .75	.60@ .70
Greenville and Mechanicsburg, Ohio	.50	.60	.60	.60	.60	.60
Hawarden & Doon, Ia.		.50		(1.20, Hawarden)		1.00
Illinois, Northern	.60	.60	.75	.60@ .70	.60@ .70	.60
Indianapolis, Ind.	.50	.50			.65	.65
Janesville, Wis.		.50@ .75			.50@ .75	
Kalamazoo, Mich.	.50@ .60	.50@ .60	.50@ .70	.60@ .80	.60@ .80	.60@ .80
LeMars, Ia.		.60				1.10
Mason City, Ia.	.60	.50	1.30	1.30	1.20	1.10
			Railway ballast and road work, .40			
Milwaukee, Wis.	1.06 for all sizes					
Minneapolis, Minn.	.40	.40	1.25	1.15	1.00	1.00
Montezuma, Covington, Ind....	.75	.75	.85	.75	.75	.75
Niles, Mich.		.50@ .80	.60@ .85	.50@ .80	.50@ .80	.50@ .80
Oxford, Mich.		.65	1.15	1.05	.95	.95
Saginaw, Mich.		.95	2.10	2.00	1.85	1.70
St. Paul, Minn.	.65*	.65*	1.75*	1.25	1.15*	1.15*
Summit Grove, Ind.	.75	.75	.75	.75@ .90	.75@ .90	.75
Terre Haute, Ind.	.75	.75			.75	.75
Toledo, O.			.60 for all sizes			
Wabash Valley District, Ind....			All sizes, .75.			
Winona Lake, Ind.		.75				.95
Winona, Minn.	.60@ .90	.60@ .90	1.00@1.40	1.00@1.40	.95@1.25	.95@1.25
SOUTHERN:						
Charleston, W. Va. (River)....		1.20		1.30	1.30	1.30
Lake Weir, Fla.	.50	.50				
Knoxville, Tenn.	.90	.90	1.50	1.50	1.50	1.25
Pelzer, S. C.	.55					
Valde Rouge, La.		1.00*	2.25*	2.10*	1.75@2.00*	
Waco, Tex.	.75	.75	1.20	1.20	1.00	1.00
WESTERN:						
Joplin, Mo.	1.00	.60	.45	1.50	1.25	2.00
Lincoln, Neb. (on cars)	1.00	1.00	2.10	2.10		1.90
Niles, Calif.	.60	.50@ .70	.50@ .70	.50@ .70	.50@ .70	.50@ .70
Pueblo, Colo.	.80	.75			1.75	
Roche Spur, Tulare Co., Cal....			.35 River sand ¼ inch			
St. Louis, Mo.	1.20@1.35	1.20@1.25	1.50@1.75	1.30@1.40	1.25@1.40	1.25@1.35
San Francisco, Cal.			1.15 for all grades gravel.			
Seattle, Wash.	1.25*	1.25*	2.00*	1.25*	1.25*	1.25*
Vancouver, B. C. (Scows)		1.45*	1.70*	1.65*	1.65*	1.45*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.		.50	.60	.60	.60	.60
Boonville, N. Y.	.50@ .65	.40@ .65				.60
Burnside, Sand Pit, Conn.	All sand, .80 cu. yd.					
Yardville, N. J.		.50@ .75				
York, Pa.		.90@1.10	(crushed rock)			
CENTRAL:						
Cleveland, Ohio			1.00@1.25 bank sand			
Covington, Ind.						.60
Des Moines, Ia.		Washed concrete mix., 25% gravel, .70; 50% gravel, .90				
Earlestead, Mich.				.75	.65	.65
Escanaba, Mich.			.85 for all sizes			
Grand Rapids, Mich.	.30@ .40					.50
Indianapolis, Ind.			Washed concrete mix, .55			
Janesville, Wis.					.50@ .75	
Moline, Ill.		1.50 yd.			1.75 yd. stge.	
Oxford, Mich.	.65*	.65*	.85*	1.40*	1.30*	1.30*
Portsmouth, Ohio		.65		.85		
Saginaw, Mich.—(River dock)		1.05	1.20	1.20	1.20	1.20
Summit Grove, Ind.			.50 for all sizes			
Terre Haute, Montezuma, Ind.	.60					.60
Toledo, Ohio						.55@1.00
Wabash Valley District, Ind....			.75 for all sizes			
Winona, Minn.			Pit run gravel under 2-in., .60@.90			
SOUTHERN:						
Howcott, La. (50% and up in rock content)						.65
Joplin, Mo.	.75	.60	.40			
Knoxville, Tenn.	.90					
Lindsay, Tex.			.44	.44		
Memphis, Tenn.	.65@ .90	.65@ .90			.85@1.10	.85@1.10
			Sand and gravel mixed for concrete, .85@1.10			
Valde Rouge, La.			Sand Clay 50% metal on ⅜" screen, .60 per ton			
WESTERN:						
Pueblo, Colo.			River Run .60 unscreened			
St. Louis, Mo.						1.40
Vancouver, B. C.		.85@1.10		1.00@1.25		.85@1.00

* Cubic yard. B Bank. L Lake. ‖ Ballast.

Old Conditions Will Not Return in Commercial World

New Order of Things Demands We Go Ahead With Reconstruction —No Indication of Lower Prices—Immediate Resumption of Building as a National Asset

By F. T. Miller

Associate Director-General of U. S. Information and Education Service*

Some Prices Higher in Europe

WE ARE NOT going to get the immigrants which we received formerly; prices of labor are higher in Europe than they were; prices of materials are higher in Europe than they have been for years, in some cases higher than they are here, and the influence of the European markets on our prices must be taken into consideration.

Prices of materials in the building line have increased 60 per cent in the face of a declining demand. Prices of other commodities have increased 109 per cent.

Former Secretary McAdoo said in substance on Nov. 17, 1918, in instructing the supervising architect to commence building for the Treasury Department, "The normal activity of the building industry will facilitate the transition of general industry from a war to a peace basis."

The purpose of this Division of the Department of Labor is to interest the nation in public work and private construction. When figures and principles are submitted to the public, each must use his own judgment as to the prudence of his individual undertaking. We are simply helping to bring about realization in this great basic industry that conditions have changed.

Reconstruction

During the reconstruction period, the labor and materials which might otherwise be idle can be fixed through this basic industry into permanent wealth which has earning power and pays taxes. Otherwise this labor and materials will go to waste. The activity of this industry is literal **reconstruction.**

Deferred construction is a part of our war debt—the first part to be paid, because through reconstruction we are making good our impaired facilities and putting ourselves into better condition to repay the remainder of our debt.

This Division is composed of men with practical training. Their desire is to present the truth to the nation.

Information obtained is being furnished to the public and transmitted directly to parties interested.

Cheaper Things May Make Fewer Comforts

The Labor Department stands for increased production, while preserving the efficiency of the capital value of the individual worker, as it is only by increased production that the comforts of life may be made more universal. A decrease in consumption may make them cheaper but the comforts of life become thus less and less available to all.

All recognize that the working man would have been ground out of existence before now if it had not been for the union, but the value of the dollar received by him as wages is the value he establishes by the quality of the service he renders.

Less than 10% of our labor difficulties in the building line are due to contests for wages. Home building and home owning is the basis of the strength of the nation. While the home is not a negotiable investment, history has shown that it pays very large financial returns in the increased efficiency of the family. The home owning spirit is awakened in about 120 cities throughout the United States in which end agitation is now active.

Building and Loan Associations

One of the greatest factors in making home owning possible is Building Loan Associations. These associations are unable to supply the demand for money made on them because they are dependent upon the weekly payments of their members, but they possess nearly two billion dollars worth of securities which they desire to pool in Home Loan Banks in each Federal Reserve district, in order that they may borrow upon these collateral assets, and with the proceeds furnish home builders with the money to undertake their small projects.

One factor in getting ourselves out of this state of liquidation is settlement by the government on war contracts either verbal or written. It is confidently expected that during the current week, Congress will give legal sanction to the moral commitments given by officials during our war emergencies, and that thus not only a large amount of capital will be immediately freed, for general industry, but, also, the past having been closed, thought and initiative may be directed to future undertakings.

* This service is a branch of the Division of Public Works and Construction Development, U. S. Department of Labor.

January Building Shows Unusual Improvement Over December

The total value of building permits for January, 1919, as officially reported to The American Contractor from 152 of the principal cities of the United States, is $23,869,215. As compared with previous years the total value shows a decline of 12 per cent for the same cities from January, 1918, and a decline of over 50 per cent for about two-thirds as many cities reporting in 1917 and 1916. It may safely be assumed that actual building during January, 1919, is only about one-quarter normal.

There is some encouragement, however, in the fact that building during January showed an improvement over December. Usually the reverse is true. The gain is only a small one, but anything which may be taken as an indication of improvement cannot be wholly disregarded in these times. The following comparisons are significant of this conclusion:

	No. of Cities Reporting.	Est. Value of Bldgs.
January, 1919.....	152	$23,000,000
December, 1918....	151	17,000,000
January, 1918.....	152	27,000,000
December, 1917....	144	28,000,000
January, 1917.....	108	56,000,000
December, 1916....	109	69,000,000
January, 1916.....	108	50,000,000
December, 1915....	109	66,000,000
January, 1915.....	72	35,000,000
December, 1914....	76	37,000,000

A Practical Joke By Our Brick Friends

IS ROCK PRODUCTS READ? Indeed it is, and the scrutiny of its readers is sometimes embarrassing. A tiny little item crept into its "passed by screens" page on January 29 to the effect that the Security Cement & Lime Co. was planning a BRICK addition to its plant!

Like all good producers, we try to keep our screenings free and clean of all clay particles, which we fully appreciate are extremely detrimental to the product. Therefore we apologize for the injury inadvertently done one of our good friends, and assure them that we will renew our screens to prevent a recurrence. We presume the item came by way of a local newspaper correspondent with a weakness for practical jokes.

Passed By The Screens

Quarries

The Banner Rock Products Co., Alexandria, Ind., has filed notice of an increase in its capital stock from $50,000 to $200,000.

For the rock bulkhead at Fish Harbor, San Pedro, Cal., 40,000 short tons of rock will be required.

The electrically equipped granite plant of Milford (Mass.) Pink Granite Co. was burned recently. Loss, $300,000, insurance less than $20,000.

Samuel Braen, Nelson Street, Hawthorne, N. J., has bid $3.00 a cu. yd. for supplying crushed stone to be used by the city of Paterson, N. J., for the year 1919.

American Ballast Co., Portland, Maine, has filed an amendment to its constitution changing the corporate name to American Limestone Co., says a news report.

Frank H. Smith, Hackettstown, N. J., has been awarded a contract by the Hackettstown Town Council for furnishing crushed stone at $2.15 per ton, delivered.

The California Granite Co., Porterville, Cal., has secured a contract for furnishing 300 carloads of granite to the Southern Pacific Co., for rip-rap work.

John Conlin, Professor of Finance of the New York University, told the Credit Men's Association in the Down Town Club, Newark, N. J., that any quarry employing children under 14, for any purpose without working papers, will be assessed an additional tax of 10 per cent on all products put out during the past year.

George H. Balfe, who recently purchased the plant of the Monon Crushed Stone Co., Monon, Ind., informs ROCK PRODUCTS he expects to begin operations this spring. The plant had been shut down during the war. For several weeks a crew have been pumping water from the quarry in preparation for the resumption of production.

The Chester Granite Quarries incorporated recently with a capital of $125,000 has organized with these officers: President, William A. Harder; Treasurer, Edward L. Harder, Philnont; Secretary, W. Sherman Harder. The company will quarry granite for monument work at Becket, Mass., near Chester, covering 1,000 acres The new corporation is a reorganization of the Hudson & Chester Granite Co., and takes over all the business at Chester. Edward N. Nalan, of Chester, is superintendent and manager.

Sand and Gravel

An appropriation of $10,000 for the purchase of sand and gravel was authorized recently by the city commissioners of Nashville, Tenn.

The Independent Sand & Gravel Co. is building a new plant at Des Moines, Iowa. E. A. Lansrud of Kensett, Iowa, is General Manager.

Hart township, Mich. has been negotiating with Miss Katie Van Aelst for possession of gravel land containing nearly 200,000 cu. yds. of material.

Colonel T. H. Bell, receiver for the Trenton Sand and Gravel Co., Trenton, Ohio, near Middletown, has advertised to sell the plant, including 70 acres, at auction, at 1 p. m., Wednesday, February 26.

The Liberty Sand & Gravel Co., of Annapolis, Md., has been organized and will erect a plant on the Leimbach farm on the Severin river immediately. It will also buy or build eight 150 ton scows. Business men of the community purchased $50,000 worth of equipment bonds with a 20 per cent bonus of common stock. A. W. Andrews, is secretary.

The Ward Sand and Gravel Co. is making rapid progress in installing machinery for their new plant near the P. O. and N. tracks at Oxford, Mich., says a dispatch. This plant will be ready for operation when spring opens, if electric power can be obtained. The plant here is stated to be the most modern and complete in the state.

According to the New Castle News, T. L. Waggoner, general manager of the Rock Point Sand Co. near West Ellwood Junction has erected a large dwelling house at Ellwood Junction, Pa., to accommodate employes. The company is doing an immense business and is going to use the bucket system for drawing up the sand from the water instead of the hoisting machine. It is the same company that is operating in the Beaver river that has purchased the Crushed Sandstone Co. plant.

Incorporations

British Feldspar Corporation, Montreal, has been registered.

Stark Coal & Lime Co., Canton, O., $50,000. B. R. Seacrist.

The Charlestown (Md.) Sand and Stone Corporation has been incorporated with S. Ralph Andrews, president of the company.

Oregon Gravel Co., Salem, Ore. Capital, $50,000. Incorporators: B. C. Miles, Anna B. Miles, A. O. Condit, Salem, Ore. Filed by B. C. Miles, Salem. General sand and gravel business.

Asbestos Mines and Power Corporation of America, of Burlington, Vt.; capital, $1,500,000, for the purpose of mining, quarrying, buying and selling asbestos, talc, all kinds of metal, their bi-products and mining and quarrying stone.

Chas. E. Arquitt of Farley, Dubuque County, Ia., is one of the organizers of a new corporation for the crushing and pulverizing of stone at Farley. The plant will be operated by electricity. Coal and building materials will be handled also.

Retail Dealers

Caldwell & Gates Co., Rio, Wis., dealers in retail lumber and building materials, cement, etc. Increase of stock from $150,000 to $300,000.

Tomkins Brothers of 48-49 Passaic St., Newark, N. J., are celebrating their thirty-second anniversary in the wholesale materials business. They have offices also in New York City and at Irvington, N. Y.

The Lautz Marble Corp., Buffalo, N. Y., has recently been organized to operate a local marble cutting establishment. R. K. Glass, G. M. Fiero and E. E. Allen, Buffalo, are interested in the company.

Crump Bros., dealers in lime, cement, brick and material products at 1570 Lamar Ave., have dissolved, and the business of Crump Bros. will be carried on in the future by W. O. Crump, under the same name and C. M. Crump will continue to carry on the business of the Crump Lime and Cement Co.

At the eighth annual convention of the New Jersey Retail Monument Dealers' Association, held on February 4-5 at the Trenton House, Trenton, N. J., the following officers were elected for the ensuing year; president, John A. Dickson, Jersey City; vice-president, E. E. Clin, Keyport; treasurer, R. B. Ward, German Valley; A. R. Baxter, Trenton, was re-elected secretary. It was decided to hold the next convention at Newark.

Lime

The Lime Association recently completed the removal of its general offices to the Mather Building, 918 G. Street, Washington, D. C.

The Missisquoi Lime Products Co., Inc., of Highgate, has filed a certificate of a proposed issue of capital stock to the amount of $250,000.

"In view of the fact that pulverized limestone has established itself as a staple and essential product, several quarries and mills have been opened for its production over the state and are now producing on a large scale," said J. O. Wilson, vice-president and general manager of the Star Lime and Zinc Mining Co. of Searcy county, Arkansas, recently.

Personals

W. S. Moore, formerly with the Cleveland Frog & Crossing Co. of Cleveland, is now associated with The Greenville Gravel Co., Greenville, O., as assistant to the president and general manager.

Manufacturers

The Barber-Greene Co., Cleveland, O., announces the strengthening of its organization as follows: W. A. Buell, sales engineer, formerly conveyor engineer of the Goodyear Tire & Rubber Co., H. W. Cudding, auditor, formerly general auditor of the Lyon Metallic Mfg. Co.

The Sterling Wheelbarrow Co. of Milwaukee, is building a large addition to its plant. This addition will contain as much floor space as the present plant. A noteworthy improvement in the design of the Sterling wheelbarrow is the new ten spoke wheel. Every user will realize that the addition of two spokes to wheel construction will greatly strengthen the weakest part of the average barrow.

The Cleveland Wire Cloth & Manufacturing Co., Cleveland, O., has just added a rolling mill to its equipment, enabling it to furnish to the trade rolled wire cloth in either the square or oblong mesh, (Cleveland Rolled Slot). This style of cloth is used where a flat surface is desirable, the cloth being woven in the regular manner and then passed thru rolls that press the wire flat, thus giving a smooth screening surface. The Rolled Slot wire screen has a greater screening capacity than the square mesh or perforated metal, in some cases showing a screened product 50% in excess of that obtained by the use of perforated metal.

Bradley Pulverizer Co., Boston, announces the purchase by the Phoenix Portland Cement Co. of Philadelphia of a Bradley Hercules Mill which will be used as preliminary pulverizer before tube mills. "The mill," says the manufacturer, "produces an extremely large output when pulverizing to a fineness of 50% thru 100 and 40% thru 200 mesh sieve. This extreme fineness which is uniform at all times, makes an ideal feed for the tube mill, increasing the capacity of the entire grinding unit." Other recent installations of the mill are: Cuban Portland Cement Co., Mariel, Cuba; International Portland Cement Corp., Argentine, S. A.; Dewey Portland Cement Co., Dewey, Okla.; Lehigh Portland Cement Co., Oglesby, Ill.

The Pulverized Fuel Equipment Corporation has been organized for the purpose of taking over the business of the Locomotive Pulverized Fuel Co., and to broaden the activities of the latter to cover the central power station, metallurgical and industrial fields. The head offices are at 30 Church Street, New York City, with Canadian office in the Transportation Building, Montreal. This Corporation installs and delivers in operation complete plants of its "Lopulco" system for the preparation, distribution, storage, feeding and burning of pulverized fuel for any steam generating or heating purposes whatsoever. Many such installations are now in use and in process of construction in connection with public utility properties and large industrial and manufacturing plants. The officers will be: J. S. Coffin, chairman; J. E. Muhlfeld, president; H. F. Ball, vice-president, executive; H. D. Savage, vice-president in charge of sales; V. Z. Caracristi, vice-president in charge of engineering; Samuel G. Allen, secretary-treasurer.

Cement

Rasmussen Cement Co., Grand Rapids, Wis., has dissolved. Atty. for the company: Chas. E. Briere, Grand Rapids, Wis.

Representative Erickson has introduced in the South Dakota legislature, a bill providing for the construction, ownership and operation of a cement mill by the state. His bill carries an appropriation of $500,000 for the purpose, to be handled by a commission.

H. F. Cook & Sons of Katni, C. P., India, are organizing a big corporation to develop extensive deposits of lime, pottery clays and beauxite (aluminous ores) which they own and they write to ROCK PRODUCTS stating they are in the market for electrically driven machinery. For the Portland cement plant which they are planning in connection, they want the most modern type of machinery for the manufacture of cement by the wet process in rotary kilns with a capacity of 50 to 100 tons daily. They also want clay-pipe making machinery.

Imports of Cement Reach Low Levels

WASHINGTON, D. C.—Imports of cement seem to have reached a low mark, and show no signs of increasing, but whether this condition is due to the fact that the United States is now self-supporting in this commodity or because of the war is yet to be determined.

Figures prepared by the bureau of foreign and domestic commerce of the Department of Commerce, show our imports of hydraulic cement in November to have been but 82 barrels valued at $68, whereas in November, 1917, we imported 143 barrels, valued at $97. Imports of other cements during the month were valued at $1,828, as compared with $2,924 for the corresponding month of 1917.

The bureau has also prepared statistics showing the imports for the eleven months ended with November. Hydraulic cement brought into the United States during that period amounted to 1,111 barrels, worth $1,153, and other cement imported reached a total value of $12,755. During the corresponding period of 1917, 8,819 barrels of hydraulic cement were imported, valued at $6,067, and other cement valued at $27,614, a decrease of $20,000 being shown in the imports of 1918. Imports during the eleven-month period of 1916 were 6,697 barrels of hydraulic, valued at $4,637, and other cement valued at $18,322.

Our exports also show a slight decrease in quantity, although the value has been enhanced considerably. During the month of November we exported 158,132 barrels, valued at $488,044, against 360,023 barrels, worth $841,982, during the corresponding month of 1917. This was a decrease for 1918 of 50 per cent, which, however, is offset by the eleven-months' exports. During the period ended with last November we exported 2,025,178 barrels, worth $5,257,285; during the corresponding period of 1917, the exports totaled 2,362,741 barrels, valued at $4,843,896, and in 1916, 2,341,079 barrels, with a value of $3,462,554.

California Governor Urges Speed in Road Work

SAN FRANCISCO, CAL.—That Governor Stephens of California is fully alive to the importance of good roads is clearly shown by the space devoted to highway matters in his message to the Legislature, in which he said:

"Immediate employment of our returning men may be provided by pushing forward with utmost speed the completion of the State highways, for which the people have already voted bonds. It is to be hoped that every encouragement of law will be given to the counties and to road districts for the development of lateral roads.

"In this day when farmers till their fields with implements propelled by gas engines and haul their crops in auto trucks, even the old-fashioned country road, serving only the need of local residents, has assumed an importance never attached to it heretofore. If there are needed changes in road laws to permit small groups of farmers to provide themselves with rural roads such changes should be carefully considered."

Texas to Push Road Building

AUSTIN, TEXAS.—If the Legislature passes the pending bill for the issuing of $75,000,000 of state bonds for highway construction an unprecedented impetus will be given to the building of roads of permanent type. Irrespective, however, of the outcome of the measure the construction of a considerable mileage of concrete highway is already assured through the voting of bonds for the purpose of different counties, and other prospective issues for the same purpose. During the year a concrete highway between Dallas and Fort Worth will be made an accomplished fact. In Navarro county a twelve-mile concrete highway is to be built from Corsicana to the Ellis county line.

CLASSIFIED ADVERTISING

ADVERTISEMENTS in this department are for Positions Wanted, Positions Vacant, Business Opportunities, Plants for Sale, etc.

RATES: 25c per line, per insertion; minimum charge, 50c. With display of any sort, $2.50 per column inch, per insertion, check with order.

Help Wanted

SUPERINTENDENT WANTED

for a quarry and stone crushing plant with capacity of 1,000 tons daily. Must be thoroughly conversant with all operations of a plant, and who can qualify to produce economically. Give experience, age and salary expected; whether married or single. Correspondence strictly confidential.

Address Box 1297, Care Rock Products

WANTED

Quarry superintendent to take charge of rock and shale quarry in the east. Steam shovel and well drill equipment, locomotive transportation. State past experience and salary expected.

Box 1295, Care Rock Products

SUPERINTENDENT—Married man wanting to invest $1,000 or $2,000 in a new limestone quarry, 60 miles from Milwaukee; owner will supply necessary cash for further development; must be familiar with quarry work and be sober. Fine location. Address Box 1296, Care Rock Products.

WANTED—Experienced man for position as Superintendent of lime and crushing plant situated in central Ohio. State experience, age, full particulars, salary expected. Position now open. Address Box 1293, care of Rock Products.

Situations Wanted

GENERAL MANAGER OR SUPT. desires engagement where careful and efficient operation is essential to increased production. Twenty years experience in heavy operations. Proven ability. Excellent references. Address Box 1290, care ROCK PRODUCTS.

Plants for Sale

FOR SALE

Stone Quarry—22½ acres at Lannon, Wis., 17 miles from Milwaukee on the C. M. & St. P. R. R. Nine buildings, gyratory crusher, pumps, screens, etc.; fully equipped for business. Will sell cheap. Address

WISCONSIN STONE CO.
544 Hartford Ave. Milwaukee, Wis.

FOR SALE—Crushed stone plant near Wymore and Blue Springs, Neb., on Union Pacific and C., B. & Q. railroads; the quarry farthest west in Nebraska or Kansas; 40 ft. of stone; light stripping; large territory; good prospects; 67 ft. of shale under quarry bed. Ideal location for fancy brick or Portland cement plant. Address G. H. Davis, Blue Springs, Neb.

FOR SALE OR LEASE: Crushed stone quarry situated near Wilkes-Barre, Pa. Very hard green sandstone, practically equal to trap rock for road material. Quarry equipped to produce five to six hundred tons per day—has frequently run eight hundred. Ample rail facilities and an extensive market. For detailed information communicate with Arthur L. Stull, 182 S. Franklin St., Wilkes-Barre, Pa.

FOR SALE—110 acres finest Ohio Gray Limestone, shale, with 50 acres 4-5 foot Coal. Quillin, 7718 Hough, Cleveland, Ohio.

FOR SALE—Crushed stone plant and equipment, formerly owned by Lenni Quarry Co., Lenni, Delaware Co., Pa. Plant is for sale as a running operation or individual equipment, such as shovels, dinkeys, well drills, elevators, screens, etc. Apply Ario Pardee, Trustee, 1230 Real Estate Trust Building, Philadelphia, Pa.

Business Cards

F. C. SCHUMACHER
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